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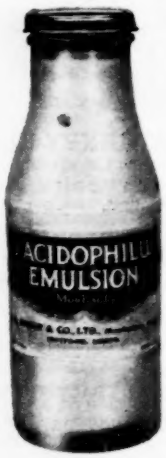

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HEALTH IN WEST AFRICA.

Delivered in the Lecture Hall of the Medical Society of London on Feb. 13th

BY D. B. BLACKLOCK, M.D. EDIN., D.P.H.,

PROFESSOR OF PARASITOLOGY, UNIVERSITY OF LIVERPOOL; LATE DIRECTOR OF THE RESEARCH LABORATORY, SIERRA LEONE.

WHEN dealing with the subject of health in West Africa, a portion of the Empire which is yearly assuming greater economic and political importance, it is customary to call attention to the improvement which has occurred in the conditions from the point of view of the white man who works there. In the past this procedure of limiting the survey to the health of the white man has been quite natural, because it is obvious that without first of all ensuring a reasonable degree of safety for the health of European officials, white members of commercial houses, personnel of shipping lines and mission workers, no progress can be made. It is only after this preliminary stage has been successfully accomplished that the truly colossal task of rendering those tropical regions reasonably healthy for the indigenous population can be envisaged.

THE HEALTH OF THE WHITE MAN.

I propose in the first place to deal briefly with some figures relating to the health of one group of Europeans in West Africa, to indicate certain gaps in our knowledge in respect to the figures of other groups, and to draw attention to one or two diseases affecting white people, which still baffle our efforts, and which call either for further elucidation by means of research or further reduction by the application of known sanitary measures on a more extensive scale.

Among white people who are subject to the influence of West African conditions the following categories may be mentioned: Government officials, and non-officials, the latter including members of commercial firms, personnel of shipping companies, missionaries, and others. In so far as the first class—namely, the officials—is concerned, I am indebted to Dr. A. T. Stanton, medical adviser at the Colonial Office, for the most recent figures relating to non-native officials in West Africa. On Jan. 1st, 1928, the total number of such officials in the Gambia, Sierra Leone, Gold Coast, and Nigeria was 3894. Of these, it is interesting to note that 339 belong to a quinquennial age-group with central age 50, and that there were no less than 60 individuals whose ages were 54 years and over, the oldest being 69. During the year, 27 officials died and 47 were invalided out of the Service, giving a death-rate of 6·7 per 1000 and an invaliding-rate of 11·7 per 1000; now both these rates are the lowest ever yet recorded for West Africa. When we compare the death-rates of 75·8 and 53·6 per 1000 per annum for the Gold Coast and Lagos respectively during the period 1881 to 1897 inclusive, we realise how great has been the advance.

Perhaps some figures from a non-medical source may be quoted in corroboration of statements as to the reduction of risk to life and health in West Africa during this century. In the *Journal of the Institute of Actuaries*, March, 1927, a paper was published by Mr. H. E. Raynes, Secretary of the Legal and General Assurance Society. In this publication the author points out that the lives on which his figures are based include Europeans of all classes from platelayers to judges; he admits that the retirements on pension for ill-health have had the effect of lightening the extra mortality for ages over 40 among those remaining in the Service; he assesses the invalided lives which pass out without pensions as of the same quality as to extra mortality as the lives pensioned for ill-health, and he comes to the conclusion that for the purpose of life assurance it would appear that an addition of 0·5 per cent. to the rate of mortality throughout the table (England Life Tables No. 8) would fully meet the case so far as these Government servants are concerned.

Colonial Office Figures.

It has sometimes been argued that the administrative cost, including that of the medical officials in the West African Colonies, has been out of proportion to the trade done with these colonies. In so far as the number of officials employed is concerned the figures certainly do not bear out this contention. The two years of 1907 and 1927 may be compared in respect to the number of officials and trade done. The Secretary of the Liverpool Chamber of Commerce has been good enough to provide me with the following trade figures relating to West African Colonies. In 1907 the total imports and exports of the British West African Colonies amounted to £16,345,095, of which the United Kingdom took £10,238,595. In 1927 the total imports and exports had risen to £60,779,476, of which the United Kingdom took £29,449,210. In 1907 the average number of non-native officials in West Africa was 1628, whereas in 1927 the average number was 3637. From these figures we obtain the fact that there were approximately 102 officials in 1907, as against only 60 officials in 1927 for every million pounds worth of trade. We see that great progress in health has occurred, accompanied by a great increase of trade and a great but by no means proportionately great increase in the number of European officials.

There are possible objections to judging the improvement shown in the Colonial Office figures as illustrative of the general health progress, as we are hardly in the position to say as yet that it applies equally to the other groups mentioned. I should like here to draw attention to one point in particular; the Colonial Office records give certain information as regards the official population of West Africa which we have not, but which it would be desirable to have, for the trading and shipping population, as we should then obtain a more complete picture of the undoubtedly remarkable diminution in the risks from disease in West Africa. It is the usual custom in some of the shipping lines serving West Africa as well as in those operating elsewhere, to pay off their personnel the moment the ship arrives at the home port of destination, and to re-engage them afresh for each voyage. Now in the West African trade this arrangement might—one can almost say that it does—lead to serious divergences between the death and sickness and invaliding-rates recorded for employees and the actual facts. With your permission I shall illustrate my meaning by referring again to the Colonial Office figures in which it is shown, you may recall, that 27 officials in the West African Service died in the year 1928. The deaths of these officials did not, however, all occur in West Africa. Of the 27 deaths only 18 took place in West Africa, and no less than eight occurred in the United Kingdom, while one occurred at sea. This illustrates the fact that a man coming from West Africa does not, by the simple process of stepping off the ship at the home port of disembarkation, rid himself of the serious and often fatal diseases which may have undermined his system during his tour of duty. For the full understanding of the health problem as it affects the white man in West Africa therefore, it is necessary to have accurate and reliable figures from the commercial firms and shipping companies, and others, comparable with those which the Colonial Office produces, so that what happens to a man after, and as a result of exposure to the conditions of West Africa, may be known, as well as what happens to him during his actual exposure to these conditions.

Improvement the Result of Scientific Discovery.

The improvement in the West African figures of death and invalidings since the beginning of this century are in the main the direct outcome of certain scientific discoveries made chiefly by medical men of many different nationalities and made, many of them in parts of the world quite remote from each other and from West Africa.

Manson, a British subject, in 1877 in China discovered that filaria undergoes development in a mosquito. Laveran, a Frenchman, in 1880 in Algiers discovered the parasite of malaria. Smith and Kilborne, Americans, in 1893 in America showed that protozoa in the shape of *Babesia* could be transmitted by ticks. Bruce, a British subject, in 1895 in South Africa associated trypanosomiasis of cattle with the tsetse-fly. Eijkman, a Dutchman, in 1897 in Java showed that fowls took polyneuritis when fed exclusively on decorticated rice. Ross, a British subject, in 1897 in India showed that human malaria parasites commence to develop in anopheline mosquitoes; in 1898 he proved the whole cycle of bird malaria in culicines. Grassi, an Italian, in 1899 in Italy confirmed Ross's work on human malaria. Looss, a German, in 1901 in Egypt demonstrated how hookworm infection occurs. Carrol, Reed, Lazear, and Agramonte, an American Commission in 1901, in Havana proved that Aëdes transmits yellow fever.

These brilliant discoveries in all parts of the world, discoveries made before this century was well begun, were what has rendered possible the progress in health of which the West African Colonies can boast to-day. They form the basis of subsequent work by innumerable observers; every year sees new discoveries and it is the application of the combined results by medical men and sanitarians which has produced the change in the death- and invaliding-rates which I have just given you and which has altered completely our outlook on West Africa, as on the whole of the tropical regions of the world.

Yet this dramatic change is not without its drawbacks; there is, in fact, at present somewhat a danger of an overswing of the pendulum; although the change from a quite obsessional pessimism to a rational optimism as regards West African health conditions has occurred in such a short space of time people are already beginning to lose sight of the fact that it is only by the rigid application of knowledge and by unremitting attention to the details of self-protection that such encouraging results have been obtained in the past and that they can be continued in the future, at least in the near future. There is, I think, a possibility that too much apprehension may be succeeded by over-complacency. People in general, too, have an overestimated idea of what has actually been accomplished in regard to certain matters. For example, I have often been asked about the prevalence of such things as mosquitoes and tsetse-flies in West Africa by people who honestly believe that these things have become quite scarce as the result of the application through sanitation of the findings of research. It is true that such insect pests as those mentioned and many similar carriers of human diseases may be quite scarce in a given compound or a single village or even in a particular town, but to speak of any of them as being scarce in West Africa as a whole is like affirming that grains of sand are already scarce in the Sahara.

As an illustration of how successful the results of research have been in limiting the mortality in West Africa, I would mention that many people are of the opinion that there is little more to be done. Men who had commercial interests in the tropics 25 to 30 years ago were compelled to take some action owing to the very fatal effects of West African diseases, which rendered the employment they offered entirely unattractive, at least to those of their employees who desired to prolong life. Medical research was called for with insistence, and there were in those days individuals interested in trade with West Africa who were prepared to expend large sums for the purpose of research and sanitation. These men have been succeeded by a generation which has never experienced a death-rate of 70 per 1000 and which

Gangosa (*Rhinopharyngitis mutilans*), showing perforation of the hard palate in patient with yaws history.

sees no reason to be dissatisfied with a death-rate of somewhere about 7 per 1000.

Research has Outstripped Practice.

It is, I think, quite correct to say that research into the causation of disease has outstripped sanitation. A great deal of work is therefore being done at present by sanitarians which has the immediate aim of devising means of applying, in places like West Africa, the necessary and known remedies with the least possible expense. This question of expense is crucial; West Africa is no Panama; if we could act to-day in a manner quite regardless of expense, I have no hesitation in saying that we could deal with the health problems in West Africa as a whole in a way which would rapidly effect a complete transformation. But, unfortunately, we are faced with the insuperable obstacle of expense. The task before sanitary officers in the tropics now is to invent means of eradicating disease, not at a cost which the future result might easily justify, but at a cost which the present resources of the colonies permit. In the ultimate result I do not anticipate that much better figures than those recorded for non-native officials, and which I have given you to-day, can reasonably be expected; but what may be expected is that after a period of oscillation satisfactory figures will be maintained with much less effort than is required at present, on the part not only of the sanitary officers but also of every white individual, European or American, living in West Africa.

I should like to say a word with reference to certain diseases which in my opinion require further elucidation or prevention. Reverting for a moment to the figures quoted we find that of the 27 deaths recorded for 1928 among the non-native officials in West Africa, 20 were directly due to disease. Although many different diseases claim victims in West Africa, such diseases as yellow fever, alarming and fatal as they are, do not cause the steady and serious mortality that is produced by certain others which appear less conspicuous solely because they do not involve quarantine regulations. Of the 20 fatal cases referred to, death was ascribed to malaria directly in two, to malaria indirectly in one, to blackwater fever directly in four, and to blackwater fever indirectly in one. The total cases therefore in which either malaria or blackwater fever was the cause of death was eight—that is, 40 per cent. This is a figure which suggests that malaria, and even more so blackwater fever, require further study. Unfortunately, no investigation upon malignant tertian malaria in its association with

blackwater has ever been carried out on a scale commensurate with the importance of these two diseases to white residents in West Africa and elsewhere. It has been left to a few isolated individuals or small groups of workers to make such scanty observations as were possible or to formulate theories as to causation and prevention. It appears to me to be fully time to examine the theories already put forward, and if these prove inadequate to inaugurate a definite scheme of continuous research to discover the genesis of blackwater fever. Failing this, it would be best to act on the assumption that the causation of the disease is closely associated with malaria. Taking as probably correct, what many of us have long believed, that blackwater fever is a phenomenon dependent upon malignant tertian malaria or upon its sequelæ, one might expect substantial results from attacking the problem from the sanitation and personal prophylaxis point of view—that is, by concentrating on still further reducing the infection with malignant malaria, and by adequate treatment of the malaria cases which occur.

Segregation.

There are one or two other points which I should like to mention; for example, it may be well to spend a few moments in considering certain aspects of the white man's contacts with the native; apropos of this it will be natural to touch upon the subject of segregation and the domestic employment of natives. The subject of segregation has been the cause of much heart-burning and acrimonious discussion, yet it is difficult to understand why this should be so, as the principle underlying the whole question appears to be extremely simple. If a non-immune person has to live with an infected—e.g., a malaria-infected population, there are two ways open to him by which he can endeavour to avoid infection. The first is to place his quarters so far from that population's quarters that the infective anopheline mosquitoes are unlikely to reach and infect him; this is segregation. The second is either to treat and cure the disease in the infected population or to eliminate all mosquitoes or both; this is sanitation, and usually it is a much bigger proposition. Segregation is advisable and necessary wherever sanitation is impossible or imperfect. The segregation of a European from infective native quarters is no more a slight on the native than is the same European's practice of living in a mosquito-proof house in the midst of an infected population. The object and, with adequate care and a proportion of good luck, the result is the same in both cases—namely, the successful avoidance of the bites of the infective anophelines. But while segregation is no reflection on the native qua native and is a necessary and unavoidable proceeding in many instances, it is none the less an admission that preventive sanitary measures are either lacking or have failed, and in this sense it *is* a reflection upon our success in sanitation. The ill-results of non-segregation in infective populations with inadequate sanitation are exemplified in the experience of places like Dakar and yellow fever.

Case with gangosa, showing a nodular eruption on the face; deformity of hand; the right knee was also much enlarged; history of yaws.

Gangosa; cartilage of nose gone; ulceration of lip. Note shortening of left index finger from absorption of bone; the nail is still there.

While on the subject of segregation I might refer to the groups of Asiatics and particularly the Syrian. The Syrian in West Africa lives in conditions which are the very reverse of segregation, and as a consequence he constitutes somewhat of a problem from the medical point of view. In order that you may understand the position I may say that in the Protectorate of Sierra Leone, for example, one finds the Syrian small trader everywhere, usually esconced in the chief's compound and often in the house next to the chief. In many districts he is the self-constituted principal adviser of the chief, and he has incidentally collected into his own hands much of the trade of the various colonies, for example, the whole of the kola trade and much of the internal rice trade of Sierra Leone; this he has been able to do largely by a policy of non-segregation, by the process of living with and among the natives pretty much on their own level, a procedure attended doubtless by some financial advantage, but certainly by no gain in health. As a result of his lack of segregation the Syrian is constantly and severely attacked by many diseases acquired from the native. He is always getting malaria, blackwater, and other diseases; in fact, he performs the function of a sort of human indicator of the prevalence of various tropical diseases in endemic areas. There are doubtless excellent reasons of which I am unaware why he should be persona grata in British West African colonies, and it is possible that he may never attain there the dimensions of a political problem, but certainly from a health point of view his presence in British West Africa appears neither beneficial to us nor particularly fortunate for himself, and he does constitute a minor medical problem.

House Servants.

The case of house servants employed by white residents in West Africa may also be mentioned briefly. In Sierra Leone I have had the experience of engaging a cook who, on the day of his engagement, armed with the usual testimonials, was suffering from acute amœbic dysentery. Fortunately he was too ill to work and complained, and his condition was diagnosed, and he was sent to hospital. This illustrates a danger to the health of white residents in the tropics to which they should not be subjected, and which is largely avoidable. I have advocated the medical examination of cooks and house servants and their registration as a necessary means of protection for the health of their white employers. In

places where facilities exist a useful medical examination of servants could be easily carried out. Even if it were considered a hardship by a domestic servant that he should be refused employment because he is a carrier of amœbic dysentery, it would scarcely be regarded as other than a benefit by his prospective employers to be notified of the danger incurred if they engaged him. In fact carriers of diseases like this might well be eliminated from the ranks of house servants and advised to adopt another means of livelihood. There is, I feel sure, a definite need for safeguarding the health of the white residents by some such means as identifiable health certificates for house servants. On the other hand, it is equally incumbent upon us to avoid as far as possible introducing our European diseases to West Africa. It does not appear right that persons suffering from tuberculosis should be admitted into our West African colonies; in view of the extreme susceptibility of the native to this disease, such a procedure can be hardly justified.

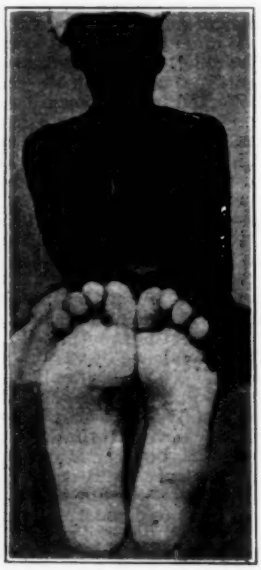
The Health of the Natives.

Let us now turn from the consideration of the case of the health of the white man in West Africa—which gives just cause for congratulation—to what I consider to-day the real problem of West Africa—that is, the health of the natives. The bush native is regarded by different observers from entirely different points of view according to individual interest.

A Reservoir of Peculiar Diseases.

Now the point of view from which the medical man engaged in research is compelled to see many of the West African natives at home in the bush unfortunately and necessarily leads to his concluding that the bush native in West Africa is a vast reservoir of peculiar diseases; that his average physique is poor and that his health is as a rule deplorable; that he is afflicted in immense numbers by appalling diseases and by deformities resulting from them. It may be said of him that considering his poor diet, his unfortunate personal habits, his environment, and his degree of infection with innumerable parasitic and other diseases, he is an outstanding marvel of racial adaptation and survival. But his partial immunity or tolerance of disease is acquired at the cost of great personal suffering. Of the rude health commonly attributed to the African natives I have heard much but seen little in the bush during ten years in West Africa. On the other hand, it must be admitted that he stands up to his difficult task of surviving his afflictions with a truly commendable fortitude. As van Loon says of primitive man, "A strange creature, surrounded on all sides by death and sickness, and yet happy and full of laughter."

Elephantiasis of the scrotum and right inguinal hernia; leucodermatous patches on skin.



Ainhum, which has resulted in the loss of both little toes.

Subcutaneous nodule due to *Onchocerca volvulus* near elbow-joint.

Provision of Medical Attention.

In the Sierra Leone Protectorate there are 1½ million inhabitants, the great majority of whom live in small villages remote from the railway and large roads and of whom only a small proportion are ever at any time of their lives within reasonable distance of skilled medical attention. The medical officers are in the proportion of 1 to 150,000 of the population, and they are necessarily stationed as a rule at the district headquarters or in military or civil centres. It has long been evident that any adequate provision of medical attention for the 25 million natives of our West African colonies is not feasible if only white or native fully qualified doctors are employed. For this reason there is now in existence a scheme for the establishment of a subordinate medical staff of natives corresponding to the subassistant surgeon of India, who, though not fully qualified, attain in many cases a high standard of efficiency. The opening up of the countries by road and the rapid introduction of motor transport is at the same time enabling existing medical officers to cover more ground in less time, so that in the course of years it may be expected that the more pressing medical and surgical needs of this great population will receive attention. This is an aspect of the results of road construction which His Excellency Sir Joseph Byrne, Governor of Sierra Leone, has kept in the foreground. The new roads will enable motor dispensaries to be used, bringing medical and surgical aid to thousands. While, however, the treatment of individual sufferers from particular diseases is an urgent matter and should be put upon a sound footing as soon as possible, the problem of the ultimate prevention of these diseases is equally urgent, and steps towards this are being undertaken now. The institution of clinics for child and maternal welfare, the inspection and treatment of school-children in larger towns, venereal clinics, and the visiting of homes by trained native health visitors are all evidence of an earnest attempt on the part of the various Governments to bring about improvements in the general health of the native. In this connexion the work of the Royal Sanitary Institute deserves mention. In order to meet a growing demand this Institute has established a special course of tropical hygiene for sanitary inspectors in West Africa, the centres being each of the four West African colonies in rotation, so that each centre will have an examination every four years. Such institutions certainly benefit the town-dwellers, but what of the bush native? As regards the large mass of natives in remote areas, I personally have always been of the opinion that a very great deal could be

done towards the prevention and eradication of disease by education of children and adults also, in simple rules of hygiene and particularly by actual demonstration of how various diseases may be prevented. I have urged that such education should be given in the vernacular and should consist largely of instruction in practical methods of eliminating dangerous mosquitoes, flies, ticks, and snails; teaching as to the dangers of insanitary methods of disposal of excreta and refuse and other obvious instruction. It is my firm conviction that a substantial amount of useful work in preventive medicine can be done by simple village natives who understand no language but their own; I hope to show you some photographs later which illustrate this. The diseases which retard the native, apart altogether from any contact he may have with white people will, for some generations, form an incentive to medical research and sanitary organisations, and will tax them to the utmost.

Goitre: a case from a large endemic area in the Kono district, Protectorate of Sierra Leone.

Readiness to Receive New Ideas.

The native of West Africa so far as I know him is a very amiable, law-abiding person, according to his lights, and in the opinion of many unprejudiced observers his lights are wonderfully good, although they may differ from ours in some particulars. Speaking of what I have seen in Sierra Leone, the opportunities which exist for advance in medical and sanitary work among the natives should not be disturbed owing to any general recalcitrance on principle on the part of the native himself. In fact it appears certain that in the eagerness of his pursuit of health the native of West Africa will be found second to none. Given a remedy capable of producing good effects in any particular disease, effects which are easily observable within a limited time, the natives will flock to you from great distances. I have had, like everyone else, amusing and embarrassing evidence of this when the natives have realised, after much initial reluctance in permitting the treatment, that diseases such as schistosomiasis and yaws could be rapidly ameliorated by injections; at once persons with entirely different diseases came forward asking for injections, and one had to explain that the injection fluid was not a panacea, a statement about which they were frankly incredulous.

A considerable stress is laid by many people upon the effects of native traditional customs on the reception by the natives of the ideas underlying modern sanitation and European treatment. It is rightly pointed out that one must be very careful not to interfere with the tribal customs and that traditional ideas must be respected or trouble will ensure. There is, so far as I can see, from a medical point of view, no necessity whatever to interfere unduly with tribal customs; detrimental customs will in time be given up by the natives themselves as soon as they become convinced that such customs are inimical to their health and well-being. As a matter of fact no native custom which is frankly brutal and apparently useless, however hallowed it may have been in the past by usage and tradition, is openly tolerated by the Government. Further, it would be difficult to imagine any more subversive change in native customs than the compulsion to pay house tax, yet this revolutionary interference with their traditions has been borne with considerable equanimity, simply because the majority have the common sense to perceive that it is advantageous to them. This same common sense will enable the native very quickly to take advantage of anything which medicine, surgery, and sanitation can do for him. There is, therefore, I believe, no need for those who wish to proceed with the work of ameliorating the health of the natives in the tropics to be deterred unnecessarily by fear of native customs.

A Survey of Disease in Sierra Leone.

I have referred to the future task of medical and sanitary workers in the tropics as colossal and I used the word advisedly. It will be my privilege merely to indicate to you the immensity of it in West Africa by reference to a survey of diseases in the Protectorate of Sierra Leone carried out by me at the request of the Government during my last two tours in West Africa. The survey was inaugurated by His Excellency Sir Ransford Slater, now Governor of the Gold Coast, with a view to obtaining some idea of the relative importance of the diseases which affect the native. During two tours I examined as thoroughly as possible samples of the population in all parts of the Protectorate. Over 10,000 natives were examined of both sexes and at all ages, every effort being made to examine all those who were not ill as well as those who were, in any particular village. In order of importance I placed foremost the following diseases: malaria, gonorrhœa, yaws. The two former, serious as they are, are regarded at present by the bush natives rather as natural accompaniments of life than as diseases. Yaws in the frambœsial stage is considered a necessary evil; its sequelæ, however, such as arthritis, bony deformities, and lesions of the feet are regarded seriously, and gangosa is much dreaded. Both forms of leprosy are of frequent occurrence and are feared, as is elephantiasis; subcutaneous nodules are numerous but are considered by the native as of no importance. Hernia and hydrocele and ulcers they complain of greatly, and these probably cause more serious invaliding than any other conditions. Goitre in certain districts is a serious endemic disease. Diseases of the eyes and ears are fairly frequent, and intestinal diseases such as dysentery and typhoid are also not uncommon. Urinary schistosomiasis is endemic in large areas, but only occasional cases of rectal schistosomiasis

Anæsthetic leprosy of many years' duration, the fingers (also toes) lost, self-cured; patient now alert and active.

were found. In the following table are shown the numbers found to be affected with a few selected diseases in the Northern Province, part of the survey of the Protectorate of Sierra Leone.

Disease.	Total examined.	Total affected.
Arthritis	2900	143
Dermatitis	2228	1106
Elephantiasis	2904	49
Eye diseases	2194	134
Gangosa	2904	64
Diseases of glands	1953	743
Hernia; hydrocele	2194	408
Leprosy	2904	183
Subcutaneous nodules	2904	306
Ulcers; sinuses; scars	2194	708
Yaws; frambœsia	2904	719

The photographs here reproduced give an indication of the variety and serious nature of the diseases which may incapacitate the native of West Africa and prevent his leading a useful life. The figures given must also be taken into account in endeavouring to assess the total amount of personal suffering involved by such diseases.

IMPRESSIONS OF PSYCHIATRY IN AMERICA.*

By EDWARD MAPOTHER, M.D., F.R.C.P. Lond., F.R.C.S. Eng.,

MEDICAL SUPERINTENDENT, THE MAUDSLEY HOSPITAL.

In discussing psychiatry in America it is fundamental to appreciate that there is no Federal unity whatever in this matter; there is no less independence and no less difference of maturity between American than between European States. Psychiatric arrangements of all kinds represent 48 entirely separate arrangements. No general law exists and nothing official which is comparable to the Board of Control as a nation-wide and standardising agency. The same is true as regards the Province of Canada. The nearest approaches to any unifying organisations are the National Committees of Mental Hygiene financed from voluntary sources which endeavour by propaganda everywhere to raise the standards of care, treatment, education, and research. Though unofficial these committees have been asked to undertake surveys of the situation and the requirements in various States and Provinces, and in some ways such unofficial bodies if of good repute have advantages over organisations like the Board of Control. Their view of situations may be more comprehensive because they more readily get access to places out of the official orbit such as schools. Just because their statements have no necessary consequences they can express their real opinions without deference to the political and financial situation of the moment. After the passage of the Mental Treatment Bill, an organisation effectively corresponding to the National Committees of Mental Hygiene in America and Canada will be more badly wanted than ever before.

The purpose of my visit to America was not to see a truly representative sample in a critical spirit. I was admittedly out to see all that was best and most interesting—the "high spots" as they are called locally. Therefore any generalisation which I may venture apply only to what I saw, and for the most part to psychiatry in America at its best. Only in special connexions shall I refer to what seem backward arrangements. I shall make no criticism of American arrangements that is not really a quotation of expert opinion there. I want especially to emphasise features of American psychiatry that are topical. The Mental Treatment Bill seems likely to be this generation's contribution to progress or reaction, and it has now reached a fairly definite form. There are many points about American arrangements which throw a flood of light on the situation foreshadowed by the Bill, but I know of no evidence that American arrangements were considered before drafting it. In the parts of America that I visited I saw an amount of psychiatric research in progress that could not possibly be equalled in a similar tour of Great Britain. I do not profess to estimate the ultimate importance of anything I saw. Results that really make a difference are, of course, the product of a very few minds in each generation, but in opportunities for solid steady contribution to knowledge America is incomparably ahead. The view-points in research represent every school, and all extremes of course, but most of it is perfectly sane. I met one thinker of the "hard-boiled" materialist school who proposed to oust the term "emotion" from psychiatry in favour of the phrase "reaction through the diencephalon." On the other hand, a psycho-analyst conducting research on treatment of dementia præcox had painted the walls of his patients' rooms yellowish brown, as a substitute satisfaction for the anal erotism which was supposed to be fundamental. But neither of these was representative.

The Differences between American and British Psychiatry.

It appeared to me that the outstanding differences of psychiatry in America included four factors, and one main resultant. The four factors were as follows:—

1. The enormously rapid growth of population.
2. The extent to which official provisions at public expense are supplemented by bequests, donations, and above all from such sources as the Commonwealth Fund and the Rockefeller Foundation.
3. The degree in which the American psychiatrist is master in his own house—a degree which is unthinkable in our lawyer-ridden land.
4. The far wider diffusion and the much higher level of psychiatric education of all kinds in America.

The main resultant of these factors is the greater tendency in America to look upon the existence of mental disorder as a problem to be solved rather than a burden to be borne.

Rapid Growth of Population.—This means that institutional provisions for mental disorder tend always to be in arrears; the results are good, bad and doubtful. In general it may be said that the shortage reduces stereotypy. It affords frequent opportunity for embodiment of new thought by the addition of new institutions and of new features to old ones. It promotes a tendency to try legitimate substitutes for institutional treatment, and even to invest money in attempts at prevention and cure. Among the many excellent things that have largely resulted from institutional shortage are the extra-mural activities of the State hospitals and State schools. Clinics based on these institutions deal largely with cases of mental disorder and mental defect, who are able to stay at large under supervision, either after a period in a State hospital or without this preliminary.

Among the bad results of institutional shortage are:—

(*a*) Overcrowding almost everywhere.

(*b*) The need in places to treat some patients with transient and incipient psychosis in the city gaol.

(*c*) Discharge of patients in some places by lay and legal authority, in disregard of the medical superintendent's opinion, to make room for others.

(*d*) A tendency in places to reserve institutions for the worst and most antisocial cases of both mental disorder and mental deficiency.

(*e*) Delay in providing public hospitals for minor cases of both conditions. This is usually rationalised by a general claim to have discovered the fallacy of early treatment.

* A paper read at the Section of Psychiatry, Royal Society of Medicine, on April 8th.

In Massachusetts—the most progressive State—mental deficiency institutions are unclassified. Massachusetts is interesting, and at least logical, in that it justifies the mixed institutions for mental defectives by the very same arguments that in London are thought to justify mixed mental hospitals, but which do not prevent mental deficiency institutions here from being graded.

One of the doubtful tendencies due to institutional shortage is the very high proportion of cases of both mental deficiency and insanity which are on parole with friends—e.g., nearly 5000 out of the 45,000 insane for whom New York State is responsible at any given time. Doubts of the consequence of this probation from the eugenic standpoint, even when it is coupled with extramural supervision, are largely responsible for the legislation which in 12 States combines sterilisation with probation and supervision.

Donations.—Much is due to the enlightenment with which this generosity has been applied; the wise use of it is the ideal corrective for the politicians' tendency to think financially with reference to the next election rather than the next generation. In most places State provision has perhaps necessarily focused on the worst cases of mental disorder and mental defect. The Commonwealth Fund and the Rockefeller Foundation, collaborating largely with the National Committees of Mental Hygiene of America and of Canada, have concentrated on a triple programme.

1. Upon promotion of the advanced training of psychiatrists and of research by the grant of fellowships at centres like the Phipps Psychiatric Clinic and at the Boston Psychopathic Hospital.

2. Upon a programme of propaganda and of prophylaxis and early treatment of minor divergences through out-patient clinics. One of the most striking movements is the provision of mental hygiene facilities at the universities as part of the health service which is a recognised provision for undergraduates.

3. Upon the Child Guidance movement which owes its growth, though not its birth, to private generosity. There can really be no doubt about its influence in reducing unhappiness during childhood, and in averting the anomalies of character that are continuous with definite neurosis and with criminality.

The Foundations in America have always observed the wise principle that the rôle of private endowment is to give a start to promising novelties and to insist that when a given service has proved its case as a need of the community, then the time has come for the community to provide that service and to finance it locally whether by taxation or by voluntary contributions. It may be rank heresy, but the policy of the American Foundations leaves me wondering whether progress might not be faster in this country if private generosity could be directed more to new ventures and less to established institutions (such as voluntary hospitals without medical schools to justify them). These would inevitably exist as a public service if not privately supported. Despite all that psychiatry owes to philanthropy in America, I want to stress the fact that our national shortage of millionaires is not a complete excuse for the gap between the best State systems in America and the best in England. Anyone who doubts the gap should make a careful study of the whole system under the Department of Mental Diseases for the State of Massachusetts—including its provision for research. This system owes comparatively little to private benefactions. The Institute of Juvenile Research in Chicago is also a splendid organisation for child psychiatry, supported wholly by the State of Illinois.

The Emancipation of the Psychiatrist.—This replacement of the static mind of the lawyer by expert knowledge, and the experimental spirit in control, is the great guarantee of the future in America. This transfer of control is most complete in the most highly organised and most progressive States, such as Massachussets and New York, and all tendency to question it—even by lawyers—seems to be over. Before detailing how the psychiatrist in America has secured the management of what are indisputably his own affairs—i.e., arrangements for the neurotic and psychotic—I may just refer to the way in which he is there getting a voice in dealing with another form of mental disorder—viz., criminality. In Detroit there is attached to the Recorder's Court (handling nearly 10,000 felonies and 30,000 miscellaneous a year) a complete psychopathic clinic with two psychiatrists and a group of social workers and psychologists. To this clinic about 1000 cases per annum are referred—felonies and misdemeanours in about the ratio of their occurrence. The reference may be:—

(*a*) Before trial—for opinion as to responsibility.

(*b*) After verdict and before sentence, as to whether this should be, on the one hand, commitment to prison or reformatory and for how long, or, on the other probation with supervision.

(*c*) For guidance as to problems arising while on probation.

The court follows the clinic's recommendation in nearly 90 per cent. of reference cases. When there is any difference the court almost always takes a less severe course than that recommended by the psychiatrist. This is a good answer to the view that asking the alienist means coddling the criminal. Ninety per cent. of cases in which probation is advised by the psychiatrist keep straight. The general usefulness of such reference is shown by the fact that even offences in connexion with driving motor-cars are found to have a correlation with mental disorder; I rejoice to say they are not pathognomonic. Similar arrangements exist at Cleveland, Ohio. Here the psychiatrist was not a whole-time officer of the court when I visited, but his appointment was being considered, since so large a proportion of all cases coming before the court were referred to him. In the two most advanced States of America, the Commissioner at the head of the department of correction is a psychiatrist. This department is responsible under the Governor for all penal arrangements, as is the Home Office in England. In the State of Maryland the Commissioner for Mental Diseases has authority to transfer any person from prison to a mental hospital, which constitutes an absolute power to adjust any punishment except that of death. Nobody seems inclined t question these arrangements.

Arrangements for Prevention and Care of Neuroses and Psychoses.

The arrangements for the future in England which will follow the Mental Treatment Bill are as follows: Hitherto the medical element of the Board of Control has been equal to the legal and lay. Hereafter it is only secure that one of the "Big Five," who are to settle all policy, shall be a doctor. A proposal that he should necessarily be a psychiatrist was negatived by the Select Committee of the House of Commons. The position of the only other doctors connected with this new Board of Control was neatly summarised by the statement that they were to be the servants or alternatively the hands and eyes of the "Big Five"—who presumably will combine the functions of brain and mouth. With this may be compared the position in the most advanced States of America—Massachusetts and New York. Here all psychiatric provision and supervision by the State is entirely in the hands of a State Department. There is no triplication of function, as hitherto, between Board of Control, county council, and guardians, nor even duplication, as now, between Local Authority and Board of Control. There is a simplification which may be roughly compared to what would exist if all public provisions for psychiatry had to the Board of Control the relation which Rampton now has. In other words, the State Department is responsible for everything in respect of public institutions, and is responsible for all rules, supervision and management, obtaining from the

legislature the necessary funds for provision and for maintenance. In private institutions it is responsible for rules and supervision. Over this Department for Mental Diseases is a permanent head—the Commissioner—with powers far exceeding in every way those of the Board of Control, having direct access to the Governor of the State without intervention of any Minister or other layman, lawyer, or politician, and through the Governor, access to the legislature. It is definitely laid down by law that the Commissioner shall be not only a doctor but a psychiatrist, with at least five years' institutional experience. Though nominally his tenure may cease with that of government by one party, in practice it is permanent. The progressive States of America have done with making political appointments to such posts, and with attempts to influence the policy of psychiatrists by political considerations. Such States have also discarded the system whereby the senior civil servant desiring such promotion is thought fit to direct the activities of the State in respect of psychiatry when a vacancy occurs, regardless of previous knowledge or experience of the subject. On the best authority I understand that in practice the Governor and the Legislature in progressive American States consider that their province is limited to deciding how much can be appropriated for new projects of the department, and whether the general financial situation permits of finding the money needed for the proposals advocated by the Commissioner of Mental Diseases. Apparently detail is left to him entirely, and even the order of priority of his proposals. With this may be compared, by those with time to spare, the official reports of the discussion upon the Mental Treatment Bill. America has apparently lost our English faith in settlement of technical detail by the inexpert. Within the Department of Mental Diseases in Massachusetts, there is no lawyer, except one concerned in recovery of contributions due from relatives of patients. There is no layman, except the woman at the head of the Social Service Division. The Assistant Commissioners or the heads of all other divisions are psychiatrists.

Of these the Commissioner is chief, with almost autocratic powers in reserve. His immediate subordinates—each in charge of a division of the department—are what we should call in England deputy medical superintendents, seconded to headquarters. On occurrence of a vacancy as medical superintendent, one of the assistant Commissioners goes back to run the mental hospital, and another deputy superintendent comes up to headquarters. Every month in Boston a dinner is held (subject to the 18th Amendment), and attended by all the superintendents and all the assistant Commissioners, with the Commissioner in the chair. At this, free discussion of official matters is encouraged. The whole scheme seems ideally adapted to reduce to a minimum the gap between regulations and reason constituting the headquarters spirit with which so many of us first became familiar in the war.

Commitment Law.

This varies in different States from the extreme of legalism to the fully medical conception. In certain States it is still, or recently was, indispensable that the alleged insane person should be tried in open court before a judge and jury, and should plead guilty or not guilty to the charge of insanity. Slight modifications of this are common. It is also common that upon a writ of habeas corpus an already certified person has to be produced in court for the question of his insanity to be settled by a jury, who may disregard the medical superintendent's opinion. This is the situation in Washington, the American home of the politician and the lawyer.

When I was there a lawyer had just been shot by a lunatic whose discharge he had obtained a year before through such a writ of habeas corpus, in spite of the fact that the man had been certified after a previous homicide, and despite the fact that Dr. White, of St. Elizabeth's Hospital, had opposed the discharge. The effect of this piece of poetic justice had not yet become evident.

On the other hand advanced medical opinion in America is moving steadily in favour of total abolition of the judicial authority in commitment procedure. It is reasonably pointed out that there is no more reason to anticipate ignorance, bad faith, or lack of reasonable care in the case of a doctor than of a magistrate, and that if, of two certificates required, one must be given by an expert and approved psychiatrist, then the patient's interests are far more adequately protected than by any magistrate. In Maryland complete dispensation with the judicial order is an established fact. A patient can be committed for permanent (not mere temporary) detention on the certificate of two medical practitioners. It is not even provided, I believe, that either should be expert and approved. But there is an onus on the Commissioner to see the patient either at an ordinary or special visit. The system works perfectly well. Abuse would involve ignorance, neglect, or conspiracy of the two certifying doctors, the superintendent and the Commissioner, and naturally does not occur. Further, the system works well from the doctor's standpoint. As a rule in Maryland the same situation exists as in England with private cases. Even though still insane, patients are usually discharged upon application of relatives who will vouch for care and control—except in rare instances of clear suicidal or homicidal propensity. Actions for illegal commitment are no commoner than elsewhere and practically never successful.

Psychiatric Education.

The education of the public has reached a point where the man and woman in the street know about the existence of mental hygiene services and are prepared to utilise these for their children and even for themselves. One of the most interesting educational projects in America—a counterblast to excessive specialism—is the foundation of the Institute of Human Relations at Yale. Here it is intended that, as the preliminary of their professional training, the future doctor, lawyer, clergyman, and others, whose business is the handling of people, shall get a common grounding in at least the elements of biology, physiology, and psychology, including among the practical derivatives of psychology, sociology and some psychiatry. It is intended to make of this psychobiology an essential common ground-work, almost as we build on a foundation of dead languages.

As to pregraduate medical education in psychiatry there is no university or medical school in this country which approaches in thoroughness that which is universal in at least ten American universities. Comprehensive courses are given in each of four years of medical training—a real grounding in medical psychology and psychopathology. The students are taught clinical psychiatry by lectures and demonstrations, and personal study of patients by allocation of definite cases of neurosis and psychosis, but above all by direction of attention to the psychiatric aspect of those illnesses seen in the ordinary wards and clinics. In Columbia as much time is devoted to the study of psychiatry as to each of the other major subjects—medicine, surgery, and gynæcology. Since quite similar situations exist in Germany and Holland and generally in progressive European countries, it seems doubtful whether the thinly veiled pride which the run of English practitioners take in their ignorance of psychiatry is really referable to our genius for practicality. There has hitherto been no diploma in psychological medicine in America, but I know that Prof. Adolf Meyer is interested in the institution of one—possibly of one in each State with equal standards.

For acquisition of technique from those actively engaged in various branches of research, and for really advanced teaching, American psychiatrists have of late years mainly gone to Vienna—except in respect of neurology, for which all say that the

National Hospital, Queen-square, is the best centre in Europe. In view of the staffing and facilities which will be available in the three psychiatric institutes which are to open shortly—those in New York connected with Columbia and Cornell Universities and that at Philadelphia, the current may well flow the other way soon.

In America, most of the ideals held up by the Committee appointed by the Board of Control on the training of mental nurses are realities. The State of New York is enforcing as a preliminary requisite of nursing a high school education until 18. The inclusion of general training in the mental nurse's course and, conversely, the mental training of both pre-graduate and post-graduate general nurses are commonplace.

My impression of the general differences representing the resultant of the four factors which I have emphasised was as follows: As to psychiatry, America is interested chiefly in development, England in maintenance. American attention is fixed mainly on what will be and English on what has been. American arrangements often seem unfinished, like everything that is growing, occasionally crude enough to offer scope to the scoffer. But efforts limited to maintaining the standards of the past in psychiatry, as in everything, are apt to fail, and fixation to be followed by regression. In actual structure and maintenance of those types of public institutions which exist in England and of amenities for patients, I doubt whether America has much that clearly outstrips the best in England. The most striking places that I saw were Bloomingdale, near New York—what we should call a registered hospital—and a hospital at Northampton, Massachusetts, run by the Veteran's Bureau (or Ministry of Pensions). Comparing the general maintenance cost of institutions in the States of New York or of Massachusetts with the cost in London, there is little evidence of better maintenance in America. Nor could I find that the public attitude to in-patient treatment there was different.

Voluntary Patients.

Owing to the wide extramural activities of American State Hospitals, these are much less suspected than their equivalents in England. But though provision for treatment of voluntary patients in the State hospitals of Massachusetts and New York has existed for many years, the public response is negligible.

In Massachusetts there are practically no voluntary boarders. In New York, of 45,000 State-aided patients, 652 were voluntary. In New York hospitals in 1927 there were 11,500 admissions. Of these, 5 per cent. were voluntary. Of this 5 per cent., one-half were recurrent; of the other half, the great majority would otherwise have been there under certificate, while most of the minority belonged to the hoboe class. This is an illuminating commentary on the Mental Treatment Bill, Clauses 1 to 4, especially when coupled with reassurances given by the Minister of Health to anxious representatives of local authorities that no new expenditure or new building need be feared—that what is intended is treatment of the same types in the same buildings by the same staff with different formalities.

It has been said that if private patients in large numbers will voluntarily enter such an institution as the Retreat, where some other patients are certified, then the poorer classes will resort to the county mental hospitals as voluntary patients when this is permitted. American experience shows this to be an utterly false analogy. Such institutions as Bloomingdale have 70 per cent. of voluntary admissions nowadays, but the State hospitals have practically none in any real sense. In fact, owing to widespread possession of means enough to pay for a time the cost of treatment outside a State hospital, these American registered hospitals are rapidly becoming the places where all but the very poor are treated for incipient and transient psychoses. The actual position is that public provision for the voluntary case by the State is as yet almost as defective in America as in England. The only wholly voluntary institution, comparable to the Maudsley, is the Phipps Psychiatric Clinic. This is splendid, but it is neither State-supported nor does it provide in any considerable measure for the poor. Both these remarks apply equally, I believe, to the forthcoming Psychiatric Clinic at Philadelphia and that connected with Cornell University, New York. The other, connected with Columbia University and located in the medical centre of New York, may be more analogous to the Maudsley. The out-patient departments of the Phipps, the Boston Psychopathic, and Cornell Clinic, New York, were the most striking. The latter is run in a general hospital like various such departments in London, but on a paying basis more like that of the Tavistock Clinic, and is well organised and flourishing.

Hospitals undertaking initial observation and treatment of psychosis under temporary treatment orders are usually managed by the city authorities, whilst hospitals for more prolonged care are maintained by the State. The Boston Psychopathic Hospital, closely connected with Harvard University by the State of Massachusetts, is exceptional in this as in all else. But splendid as it is, and negligible as are the formalities attending commitment there, there were only 58 voluntary admissions out of 1906 in 1928. This suggests how little importance the public will attach to any difference about admission under Clause 5 of the Mental Treatment Bill. The reduction of formalities is far greater in regard to admission to Boston Psychopathic than under Clause 5.

The City Psychopathic Hospitals in many cases have university connexions and useful functions in teaching. From the standpoint of the patient I gathered that their repute was not high. Of the Belle-vue in New York it is fairer not to speak, since it has been decided to abandon and replace the psychiatric part of this. Others that I saw seem better than most London observation wards, but far from ideal. They were mostly constructed of glass, metal, tiles, and concrete in what has been called the neo-lavatorial style of architecture. The ease with which they can be washed down with a hose doubtless admirably adapts them to their special purpose, but it is difficult to reconcile with a home-like atmosphere.

It is not better buildings or maintenance that constitute the real difference of American psychiatry. The difference depends upon the medical spirit dominating it, and consequent pre-occupation with treatment and research. An outstanding feature of all American institutions is the number of doctors St. Elizabeth's Hospital, Washington, with over 4000 patients, has 40 doctors, and Dr. White reckons that the right proportion is one doctor per 100 patients. Elsewhere the proportion accepted is one per 150 with a special allowance in proportion to admissions. This ratio would just double the number of medical officers in all London hospitals. In reality the amount of medical work which is possible is much greater owing to reduction of clerical work by the use of dictaphones and stenographers. Scientific work is encouraged by establishment, just below the superintendency, of three equal positions—that of administrative assistant, clinical director, and pathologist—each providing a satisfactory career. The medical superintendents of most of the notable State hospitals have teaching positions, and all the junior staff are stimulated—not forbidden—to form connexions with other hospitals outside. In spite of this, in America, as in England, there is difficulty in getting doctors of the best quality to enter psychiatry. This exists even in the schools where teaching is best; staff vacancies are not readily filled from the universities with which the psychiatric clinics are connected, and candidates have to be sought outside. To some extent the difficulty is declining as the repute of psychiatry grows. But one difficulty which remains is creditable to the moderation of the medical profession in view of its

control of the situation. Though the numbers of medical officers are high, salaries are low; they seemed on the average to be little higher than in England. Considering the general scale of American incomes, I think this clearly means a relatively lower financial status. It is a pity if this should prevent advantage being taken of the splendid opportunities which exist.

Judged by the standard of recent achievement, psychiatry in America is probably, on the whole, the equal of that in any country of the world, but it is very uneven in all respects. Hardly anywhere is everything all that one might fancy, but somewhere every improvement that we are merely talking about is in working order, serving as the little leaven that leaveneth the whole mass. America, like every country, has its cranks, but the people who are directing the development of its psychiatry are not that. They have the national readiness to try anything once, but to me they seem to be neither credulous nor given to making claims. In fact they seemed full of the "enthusiasm without illusions" that is the true scientific spirit. I have had glimpses of the psychiatry of ten European countries. I think the future is more secure in America than in any other country because it is rooted in the four factors of which I spoke. Lastly, in view of the respective estimates of British and American psychiatry prevalent outside the two countries, there is little room for that complacent tolerance towards the enthusiasms and efforts of others which is apt to pass for humorous wisdom in England, and seems so maddening to all the other nations of the earth. Those who can may hope that the leadership which has produced the Mental Treatment Bill as it is will somehow secure the expensive supplementary arrangements which alone will make it more than a change in formalities. Others may hope that, if an opportunity for real progress is given to the next generation, it may be based on knowledge of arrangements actually working elsewhere, rather than on lawyers' bogeys subtly evolved from the inner consciousness.

THE RELATION OF ACETO-ACETIC ACID TO DIABETIC COMA,

AND THE CAUSE OF DEATH.

By E. C. DODDS, M.V.O., M.D. Lond. Ph.D.
COURTAULD PROFESSOR OF BIOCHEMISTRY, UNIVERSITY OF LONDON;
AND
J. D. ROBERTSON, M.B., D.P.H. Lond.,
ASSISTANT CHEMICAL PATHOLOGIST, MIDDLESEX HOSPITAL.

(From the Courtauld Institute of Biochemistry, Middlesex Hospital.)

This communication is concerned mainly with two aspects of diabetic coma: firstly, the factors leading to the establishment of the condition; and secondly, those responsible for death in coma.

Cause of Diabetic Coma.—Amongst the views expressed by various writers on this subject, those ascribing the condition to ketosis or acidosis occupy by far the most important position. Supporters of the acidosis theory maintain that coma is due to the production of acids following the faulty metabolism of fats, and that the accumulation of such acids in the blood leads to a depletion of the alkali reserve. This value sinks from a normal of some 52–75 c.cm. CO_2 per cent. to 20 c.cm. or lower in the majority of patients with diabetic coma, and the relative constancy of this finding has led many observers to regard a depleted alkali reserve and diabetic coma as being causally related. Whilst it is well known that acidosis will produce an increase in the depth of respiration, it is equally well realised that acidosis occurring in non-diabetic conditions such as prolonged vomiting and the terminal stages of nephritis, will not produce the symptom-complex of diabetic coma. The frequently recorded observation that diabetic coma can occur with either a normal or only slightly depleted alkali reserve, forms another argument against the acidosis theory.

The ketosis theory ascribes the onset of coma to the increasing accumulation of ketone bodies, such as aceto-acetic acid and β-hydroxybutyric acid, in the circulation. The evidence in favour of this theory is two-fold: firstly, the concentration of acetone bodies in the blood greatly increases in comatose and pre-comatose conditions; secondly, the careful animal experiments of Hurtley and Trevan[1] showed that if aceto-acetic ester is injected intravenously into cats the amplitude and frequency of respiration is greatly increased. As a result of these observations these workers suggested that the onset of coma could be explained by the increase of aceto-acetic acid in the blood. They attributed the symptoms to the presence of the enol group in aceto-acetic acid and showed that other substances containing this group also produced an increase in the rate and amplitude of respiration. The only determinations of aceto-acetic acid in the blood found in the literature are those of Marriott,[2] Geelmuyden,[3 4] and Kennaway.[5] The latter investigated blood from diabetic patients which, with one exception, had been obtained at autopsy. He supported the view propounded by Hurtley and Trevan. It is interesting to note that his observations record concentrations very much higher than those about to be described. Kennaway also suggested that a continuous series of investigations on patients during and after coma would be necessary before the theory could be accepted in its entirety, and we have followed out this suggestion.

Since no answer has been given to these problems it was thought that an investigation of diabetic coma from the point of view of the variation in both the aceto-acetic acid content of the blood and in the alkali reserve would be of interest.

Observations on Patients.—The following account is based on a study of seven cases. Of these, four were in definite diabetic coma and showed the classical symptoms of unconsciousness with Kussmaul respiration, subnormal temperature, and reduced intra-ocular tension. Two cases were in a pre-comatose state and were severe diabetics who developed gastro-intestinal symptoms, subnormal temperatures, and weakness. They were sufficiently well to walk to hospital, and being experienced diabetics realised that their condition was urgent. The seventh patient was suffering from inoperable carcinoma of the breast with secondary deposits. Severe diabetes was also present, requiring at least 50 units of insulin a day for the control of a very restricted diet. In view of the terminal nature of the malignant disease it was decided to impose no dietetic restrictions or treatment with insulin. This series of cases presented two aspects of diabetes; the first six were severe cases in whom every attempt was made to control the condition, whilst in the seventh case, also a severe diabetic, no such attempt was feasible.

Methods of Investigation.—The alkali reserve of the blood was estimated by the method of Van Slyke,[6] great care being taken to ensure uniformity in the determinations. Thus, saturation of the specimen with CO_2 was performed by a gas mixture containing 5·5 per cent. CO_2 in air in a cylinder. The acetone bodies in the blood were estimated by the method of Behre and Benedict[7] in the form of volatile and non-volatile acetone bodies. Since the blood contains little or no acetone[8] these estimations correspond respectively to aceto-acetic acid and β-hydroxybutyric acid.

Results: Ketosis.—In Table I. will be found a record of the aceto-acetic and β-hydroxybutyric acids in the blood of the seven cases referred to above. The observations quoted were the highest figures found during the course of the condition. It will be remembered that Case 7 was the patient

with inoperable malignant disease. Despite the fact that insulin administration was discontinued this patient did not go into coma. The diet was liberal and the patient was allowed to eat fats freely. The blood-sugar rose to 500 mg. per 100 c.cm. and the urinary output of sugar reached 11·7 mg. per 100 c.cm., whilst the daily excretion of urine varied from 2000 to 2900 c.cm. This patient showed no symptoms of coma, the alkali reserve averaged 65 c.cm. CO_2 per cent., and on the day before death was 63 c.cm.

TABLE I.

Case.	Condition.	Aceto-acetic acid.	β-hydroxybutyric acid.
		mg. per 100 c.cm.	
1	Coma.	27·0	78·8
2	,,	24·5	44·4
3	,,	43·5	64·5
4	,,	25·0	40·0
5	Pre-comatose.	11·5	93·0
6	,,	40·5	34·3
7	Non-comatose.	35·3	133·0

An inspection of the table reveals the interesting fact that the amount of aceto-acetic acid in the blood bears no relationship to the clinical state. Thus, one of the patients in the pre-comatose group possessed a higher concentration of aceto-acetic acid than three of the patients in the comatose group, whilst the seventh patient had a higher figure than three of the patients in coma. It is admitted by most workers that β-hydroxy-butyric acid bears no relationship to the ætiology of coma, and the results in the table bear out this view.

TABLE II.

Case.	Alkali reserve: c.cm. CO_2 per cent.	Case.	Alkali reserve: c.cm. CO_2 per cent.
1	8	8	42
2	13	9	40
3	24	10	36
4	14	11	29

Acidosis.—Turning now to the acidosis theory, observations on four of the above patients together with four from a different series of cases of diabetic coma are recorded, and in Table II. will be found the lowest alkali reserve content of the blood. It will be seen that the figures are very variable indeed, ranging from 8 to 42 c.cm. These observations confirm the fact that there is no constant relationship between reduction of the alkali reserve and diabetic coma.

In cases of non-diabetic acidosis, such as that occurring in uræmia, or persistent vomiting, the alkali reserve may be reduced to as low a figure as 12 c.cm., as happened in a patient examined by us, without the patient losing consciousness. To conclude, therefore, a patient may be in diabetic coma with either a high or a low alkali reserve, and, alternatively, a non-diabetic patient may have a very low alkali reserve and still be conscious.

TABLE III. (Case 3).

Date in 1929.	Time.	Aceto-acetic acid.	β-hydroxy-butyric acid.	Alkali reserve: c.cm. CO_2 %.
		mg. per 100 c.cm.		
28/12.	9.0 a.m.	43·5	40·0	24
	12.30 p.m.	43·5	64·5	24·5
	3.0 p.m.	41·7	64·5	32·5
	6.0 p.m.	18·2	17·7	47
	10.0 p.m.	10·9	5.0	53
29/12.	2.0 a.m.	2·4	25·0	53

2.30 a.m. death.

In order to follow the course of events in diabetic coma, blood analyses were performed at three-hourly intervals until recovery or death took place. In Table III. are recorded the variations in the acetone bodies and alkali reserve in a fatal case of diabetic coma.

It will be seen that the aceto-acetic acid content of the blood fell steadily until the fatal termination. The alkali reserve rose, and it would appear that neither of these values bears any relationship to the cause of death. It is also interesting to note that this patient only received half a drachm of sodium bicarbonate and yet the alkali reserve rose steadily until death supervened. A post-mortem examination failed to reveal any complications.

Closely parallel figures to those in this table are found in Table IV., the analyses in this case being performed on a patient who recovered. These observations seem to show that neither the acidosis nor ketosis theory adequately explains the cause of diabetic coma.

In addition to the fact that the concentration of aceto-acetic acid in this patient's blood when in fully established coma was considerably below that of our non-comatose patients, it increased after the patient recovered consciousness. This unexpected observation was confirmed in subsequent cases, and therefore provides another argument against the enol theory.

TABLE IV.

Date in 1930.	Time.	Aceto-acetic acid.	β-hydroxy-butyric acid.	Alkali reserve: c.cm. CO_2 %.
		mg. per 100 c.cm.		
22/3.	10.45 a.m.	25	40	14
	12 noon.	Recovered consciousness.		
	3.0 p.m.	40	35	47
	10.30 p.m.	26·3	21·6	68
23/3.	10.30 a.m.	33·3	30	55
24/3.	10.30 a.m.	20	30·8	51

The Cause of Death in Diabetic Coma.

Three possible causes of death in cases of uncomplicated diabetic coma may be put forward: (1) advancing coma—i.e., acidosis or ketosis according to the theory supported; (2) nitrogen retention; (3) circulatory failure.

In the previous pages it has been shown that even with appropriate treatment causing reduction of the blood-sugar and a concomitant rise in the alkali reserve the patient may still die. Nitrogen retention occurs in some cases of diabetic coma but appears to bear little relationship to the question of death or recovery. Cases of combined uræmic and diabetic coma are, of course, excepted from this series. The last theory—namely, that of circulatory failure—must be adopted if only by a process of elimination. It has received considerable support from such writers as Joslin, and more recently Graham[9] and one of us (E. C. D.).[10] A constant finding in fatal cases described by previous writers and also observed in this institution is a persistently falling blood pressure. In the last three cases the blood pressure was unobtainable at the brachial artery, and was certainly below 60 mm. Hg systolic. Another invariable symptom is collapse of the veins, making it exceedingly difficult to obtain blood by the usual routes. Some workers (Graham, Kennedy) have described alterations in the appearance of the blood removed from such patients and have remarked on the difficulty of obtaining it by a syringe. They describe it as being sticky. This phenomenon has been attributed to the concentration of the blood and is associated frequently with a raised hæmoglobin content. In order to investigate this problem, the variations in the hæmoglobin and total solids content of the blood were studied. As this proved more elaborate than was originally expected it will form the subject of a future communication, and it will here suffice to refer to the findings very briefly.

Observations on a series of patients in diabetic coma showed that the hæmoglobin content as estimated by Newcomer's method did not rise above the normal figure of about 15 g. per 100 c.cm., whilst the total solids

yielded similar results—i.e., they did not rise above the highest normal figure of 23 g. per 100 g. of blood. If the patient recovered from coma it was found that the hæmoglobin content fell rapidly, as also did the total solids. It appears, therefore, that although there is little evidence in this recent series of concentration, yet there is definite evidence of dilution following recovery. In support of this it was also observed that the veins became fuller when the patient recovered, and one in whom there were no veins palpable or visible at the elbow, and from whom the blood had to be collected by arterial puncture when in coma, developed normal and full veins on recovering consciousness.

Many observers (Bock, Field, and Adair,[11] Rosenbloom,[12] McCaskey,[13] Starr and Fitz[14]) have recorded the death of patients in coma with no acetone bodies in the urine. This has led them to postulate the production of an unknown acid body. It would appear that the phenomenon might be explained on the line of circulatory failure, since in Case 3 treatment had reduced the acetone bodies to within normal limits and had raised the alkali reserve, yet death supervened from circulatory failure.

With regard to the alteration in the composition of the blood in coma, it is perhaps permissible to digress from the chemical aspect and mention the leucocytosis which always occurs in diabetic coma. This is not described in the majority of text-books and in our experience is very little known. It is described by Allen[15] and Joslin.[16] In all cases examined by us there was a definite leucocytosis with over 20,000 white cells per c.mm. It seems, therefore, that this should be borne in mind in the differential diagnosis of any condition giving rise to leucocytosis.

Summary.

1. A study of (*a*) the aceto-acetic acid and (*b*) the alkali reserve content of the blood in patients in diabetic coma failed to support the theories of ketosis and acidosis respectively as a cause of this condition. Thus, in many cases non-comatose diabetic patients were found to have a higher aceto-acetic acid content than the comatose patients, and it was found impossible to correlate the blood analyses with the clinical condition of the patient.

2. On recovery from coma it was found that the aceto-acetic acid content rose, thereby further indicating that the enol theory of diabetic coma is improbable.

3. In the fatal cases it was found that death was preceded by a persistently falling blood pressure, and the importance of circulatory failure is indicated.

4. The occurrence of leucocytosis in coma is confirmed.

We have to thank Dr. G. E. Beaumont, Dr. G. E. S. Ward, and Dr. D. E. Bedford for giving us permission to examine their patients.

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DONCASTER ISOLATION HOSPITAL.—The Doncaster Corporation's new Isolation Hospital, on the edge of the borough, which has cost £53,000, was opened recently. There are five blocks of wards and a sanatorium with accommodation for 98 patients, an administrative block, and a home for the resident medical officer.

SPINAL CORD TUMOURS.

BY ALEX. MILLS KENNEDY, M.D. GLASG., M.R.C.P. LOND.,

PROFESSOR OF MEDICINE AND DIRECTOR OF THE MEDICAL UNIT, WELSH NATIONAL SCHOOL OF MEDICINE, CARDIFF;

AND

LAMBERT ROGERS, M.SC. WALES, F.R.C.S. EDIN., F.A.C.S.,

SENIOR ASSISTANT IN THE SURGICAL UNIT OF THE SCHOOL.

IN THE LANCET of Feb. 4th, 1928, we recorded six cases of tumours of the spinal cord which had been under our care within one year. The present communication deals with points of special interest presented by three additional cases. Two were women, aged 42 (Case 1) and 24 (Case 3) respectively, and one a man, aged 32 (Case 2). There was no occupational incidence, nor was there a history of injury preceding the onset of symptoms in any of the cases. In Cases 1 and 2 the tumour was situated in the thoracic region of the cord, in Case 3 in the cervical region. This last case was of special interest because a swelling had appeared in the side of the neck about six months before spinal symptoms became manifest and led us to make a tentative diagnosis of a "dumb-bell tumour"—i.e., a tumour having one part outside and another part inside the spinal canal, the parts being joined by an isthmus passing through an intervertebral foramen. This diagnosis proved ultimately to be correct.

A feeling of coldness or numbness was one of the earliest symptoms in each of the cases. In the cervical case this symptom was first referred to the right hand, in the other two cases (thoracic) it was referred to one or both lower limbs. One thoracic case had, in addition, a tingling sensation in both feet as an early symptom, and the other had a sense of constriction in the lower part of one thigh. The cervical case developed "tingling" in both hands about four months after the onset of the numb feeling. In this case, also, loss of power in the right hand and arm quickly followed the initial feelings of numbness, and within four months the patient was quite unable to use this limb. In the two thoracic cases slight stiffness developed in one leg, associated with some dragging of the foot, three months after the initial symptoms in one case, and six months after in the other. All three cases had suffered from a "girdle" sensation at some period in their course but not at the beginning. This sensation was not one of pain but rather of constriction—like a "tight band" around the body. Only one (Case 1) exhibited root pains and these were not constant and only appeared late—about ten months after the onset of other symptoms. No tenderness over any of the vertebræ was made out and no abnormality of the spine was found.

The spinal level diagnosis was arrived at from a careful study of the physical signs, but in all cases confirmation was sought, prior to operation, by lipiodol injection into the spinal subarachnoid space by puncture of the cisterna magna as described in our previous paper. Before the lipiodol injection the spine was X rayed to exclude any lesion of the column. After the injection the spine was X rayed immediately, six hours later, and again at the end of 24 hours. The Wassermann reaction in blood and cerebro-spinal fluid of all cases was negative. The cerebro-spinal fluid, as obtained by lumbar puncture, in all cases was colourless under normal or lowered tension, not spontaneously coagulable, and showed no increase of cells and only the slightest increase of protein. The Queckenstedt (jugular compression) test produced in the cervical case a rise in cerebro-spinal fluid tension of from 40 to 70 mm. only, thus indicating some obstruction in the cerebro-spinal canal, but in the thoracic cases the fluid tension quickly rose from 115 mm. to over 300 mm. in Case 1, and from 65 mm.

to over 300 mm. in Case 2, and so failed to indicate any gross blockage of the canal.

Pathology of the Tumours.

The tumour was extramedullary in each case. In Case 1 it was soft, lobulated, and encapsuled, lying within and adherent to the dura posteriorly, and indenting but not infiltrating the posterior aspect of the cord. It was ovoid and nearly an inch in length, quite free from nerve roots, and was easily and completely removed with a piece of the attached dura. Case 2 also presented a soft lobulated tumour underneath and incorporated with the arachnoid but not adherent to the dura. Fully one and a half inches in length, it lay on the right anterolateral aspect of the cord, filling up half the dural canal and compressing and displacing the cord to the left. The fourth dorsal posterior root on the right side crossed the lower part of the tumour and had to be cut in order to facilitate removal, which was complete but piecemeal.

In Case 3 a hard lobulated mass was present within but slightly adherent to the right posterolateral aspect of the dura, and indented but did not infiltrate the right side of the cord. The mass within the dura measured about three-quarters of an inch vertically and was connected to a pedicle which passed through the intervertebral foramen between the axis and the third cervical vertebra. The inner end of this pedicle formed a congested bulbous swelling in the extradural space and the outer end was connected to a larger mass in the rght side of the neck. The pedicle fitted the intervertebral foramen tightly and had produced an expansion of the opening by pressure. The mass in the neck was multilobular. A few small lobules lay close to the foramen and one, much larger, about the size of a pigeon's egg—the main portion of the tumour—lay between the muscular planes formed by the rectus capitis anticus major in front and the scalenus medius and levator anguli scapulæ behind. All parts of the tumour appeared to be enclosed in a common capsule and no trace of the right third cervical nerve could be made out. The whole of the intrathecal portion of the tumour with the attached dura was removed piecemeal and the pedicle cut across flush with the dura. No attempt was made to remove the pedicle or the larger extraspinal portion of the tumour at this stage.

The tumour in Case 1 proved on microscopical examination to be a typical meningeal endothelioma. It was composed of small whorls of spindle-shaped cells with a considerable number of hyaline concentric masses, a number of them showing deposits of lime salts—so-called psammoma bodies—but only a few hyaline strands were visible. In Case 2 the tumour was also a typical meningeal endothelioma of similar type. The spindle-shaped cells were rather loosely arranged in small whorls and contained many hyaline strands and numerous hyaline concentric masses—so-called psammoma bodies—but no calcareous deposits.

In Case 3 the tumour was of a rather different type. Microscopically it was found to be a very cellular fibroblastic growth with rather a whorled formation. The spindle-shaped cells showed a marked tendency to palisade arrangement, especially around the vascular spaces. There were no hyaline concentric masses. The tumour appeared to be a neurofibroma and probably originated from the sheath of the third cervical nerve.

Clinical Features.

The principal clinical features of the three cases are briefly summarised below. The signs were those present when the patients came under our observation.

CASE 1.—A female, aged 42, had had symptoms for one year. Feelings of coldness and numbness commenced in the lower part of the right thigh and extended within six months to the corresponding part of the left thigh. A feeling of band-like constriction in these parts was next observed and shortly afterwards the right leg began to "drag," and the patient occasionally tripped over a stone and fell. Cold and numb feelings were next experienced in the feet, and these gradually spread up throughout both legs and thighs. Two months later (eight months after the initial symptoms) the left leg began to "drag" also, so that the gait became spastic and jerky. At this time the patient began to experience involuntary flexor spasms of the hamstring muscles, first in the right leg but soon in both. Spasticity in the legs and the associated difficulty in walking became so marked that she was obliged to take to bed a month later (i.e., nine months after the onset of the initial symptoms). The lower part of the back and perineum next began to feel numb and, within a month of taking to bed, she began to experience at intervals a tight band-like feeling in the right side of the lower abdomen. This soon disappeared, but the corresponding part of the left side then became similarly affected. A feeling of tightness across the upper abdomen also appeared at this time, and the patient frequently experienced a sharp pain shooting from the angle of the left scapula round below the left breast. She then began to have considerable aching pain in the legs, the flexor spasms increased in frequency, and two months later—about 12 months after the initial symptoms—she came under our care. Normal desire to micturate was gradually lost during the illness, but she was able to empty the bladder voluntarily until after coming under our care. The bowels had been constipated since onset.

She showed complete and marked spastic paraplegia. Both legs were flexed at the knees and hips, and were painful. She was quite unable to stand or to move her legs, but there was no obvious muscular atrophy. Some cardiac failure was present; she was dyspnœic, requiring a bed-rest, and her feet and ankles were œdematous, and moist râles were heard at the bases of the lungs. Cystitis soon developed and later incontinence of urine and fæces. Sensory changes were present in both lower limbs and in the body up to a line encircling the trunk at the level of ensiform cartilage in front and the sixth dorsal spine behind. Sensibility to brush and pin-prick were diminished in front from the level of the ensiform cartilage down to the level of the umbilicus on the right side and to the level of the anterior superior iliac spine on the left; below these latter levels sensibility to brush and pin-prick was completely lost. Thermal sensibility diminished from the level of the ensiform cartilage down to the level of the anterior superior iliac spines, and was absent below this level. Deep sensibility was present but diminished from Poupart's ligament downwards—more so in the left leg. Posteriorly, sensibility to brush and to heat and cold diminished from the level of the sixth to the ninth dorsal spines on the left side, and from the sixth dorsal spine to the seventh space on the right side, and was absent below these levels. Sensibility to pin-prick was diminished on both sides of the back from the level of the sixth to the tenth dorsal spines and was absent below this. Vibration sense was absent throughout both legs, and diminished over the symphysis pubis and anterior superior iliac spines—more so on the left—sacrum, lumbar, and dorsal spines up to and including the tenth dorsal. The knee- and ankle-jerks were exaggerated on both sides, and ankle-clonus was present. Both plantar reflexes were extensor. The abdominal and epigastric reflexes were absent, but the arm-jerks were normal. The spinal level diagnosed was the seventh thoracic segment. Lipiodol was held up completely at the level of the disc between the second and third thoracic vertebræ. Six hours later, however, most of the lipiodol had passed right down to the lower end of the meninges, about one-sixth remaining at the above site, and a few drops being visible here and there on the way down. No further change was noticed after 24 hours. Partial "spinal block" was thus indicated.

CASE 2.—A male, aged 32, had had symptoms for ten months. He complained of a "cold feeling" in the front of the thighs and lower part of the abdomen, and of tingling in both feet and, about three months later, numbness of both feet and legs in addition. Gradually the right leg began to feel stiff and at this time a feeling of tightness across the lower abdomen, about the level of the iliac crests, was experienced for about two weeks. The bowels were persistently constipated, and after micturition he always felt as if the bladder were not completely emptied. Little change occurred until four months later when, with slowly increasing stiffness in the right leg, the right foot began to "drag," and both feet became so numb that he was "unable to feel the ground." One day, about a week after this, his right leg "gave way" under him, and shortly afterwards his left leg began to feel stiff also. Spasticity in both legs then quickly increased, so that he was unable to get about and began to experience spontaneous flexor spasms in one or both legs. The feeling of tightness across the abdomen then returned, he began to have much difficulty in controlling the urinary sphincters, and shortly afterwards he came under our care—ten months from the onset of the initial symptoms.

Both legs were moderately spastic and spasticity increased on flexion. Occasional twitching movements were seen in the

leg muscles. Incontinence of urine was present. (Cystitis developed shortly afterwards.) He was a sparely-built man, thin, but without local muscular atrophy. From the level of the nipples to a horizontal line midway between the ensiform cartilage and the umbilicus sensibility to pin-prick was diminished. From one inch below the nipples down to the same horizontal line sensibility to a brush and to heat and cold was diminished. Below this level thermal sensibility was absent, and sensibility to brush and to pin-prick was absent on the right half of the body and in the right leg and almost absent on the left. Posteriorly pin-prick, brush, and thermal sensibility were diminished from the level of the seventh dorsal spine downwards. Pin-prick sensibility was reduced down to the level of the tenth dorsal space on the right side and the eighth on the left; brush down to the eighth on both sides and thermal down to the tenth. All three sensations were completely lost below these levels. Vibration sense diminished from the eleventh dorsal spine downwards, and was absent throughout both legs and over both anterior superior iliac spines. The knee- and ankle-jerks were exaggerated on both sides, the right more than the left; ankle-clonus was present and more marked on the right side. The plantar responses were flexor and equal. The abdominal reflexes were absent and the arm-jerks normal. The spinal level diagnosed was the fifth thoracic segment. Most of the lipiodol was held up at the lower part of the body of the second thoracic vertebra; the rest passed to the lower limit of the meninges leaving one or two droplets on the way down. There was practically no change in 24 hours. Incomplete "spinal block" was indicated.

CASE 3.—A female, aged 23, had had symptoms for ten months. After an attack of influenza a rounded swelling had appeared fairly suddenly in the right side of neck about six months before the onset of spinal symptoms. Quickly increasing to the size of a walnut, it had then seemed to remain stationary, except that occasionally it would be slightly painful and feel a little larger. Spinal symptoms began with numbness, loss of feeling, and weakness in the right hand. This numbness and weakness gradually spread up the right arm until, four months later, the weakness had become so marked that the patient was unable to feed herself with this limb. About this time also tingling sensations appeared in the right hand and trunk, and shortly afterwards she began to experience loss of feeling in the left hand. The left arm soon began to feel numb also, and weakness and tingling sensations set in. Two months later the right leg began to feel weak and "loose about the knee"—as if it would not support her—the right foot began to "drag," and tingling sensations were experienced in the thigh. In another two months the left leg began to feel stiff, the left foot began to "drag," and tingling sensations were felt in this thigh also, and the patient was only able to get about with the greatest difficulty and with assistance. At this time she accidentally burnt her left hand without feeling it. A month afterwards tingling sensations were experienced throughout both legs, and a tight band-like feeling around the chest at the level of the axillæ. This feeling of constriction persisted, with occasional intermissions. About this time, however, sensation began to return in the right hand. About a month later flexor spasms began to affect the left arm and shortly afterwards she came under our care. The bowels were constipated and urinary symptoms were absent until after coming under our observation.

There was a rounded swelling about the size of a walnut on the right side of the neck, partly under and partly behind the sternomastoid, and with its upper edge about one and a half inches below the lobe of the ear. It was firm, non-fluctuating, and not adherent to skin or sternomastoid, but appeared to be fixed deeply in the neck. It was slightly tender at its lower part but only on deep pressure. Weakness and stiffness were present throughout both upper limbs, slight on the left and more marked on the right. There was also some weakness of the right shoulder muscles and a tendency to contracture of the flexors of the right forearm, hand, and fingers. The right arm was generally slightly thinner than the left but there was no local muscular atrophy. The lower limbs were spastic and uniformly thin below the knees. Lying in bed the patient could flex her knees and thighs but could only move her ankles and toes very slightly. She was quite unable to stand unsupported, but could take a few short steps if assisted and her body supported. Sensibility to brush, pin-prick, and heat and cold was diminished throughout the left lower limb and the left half of the trunk up to the level of the second rib in front and the spine of the scapula and second dorsal spine behind. Throughout the left upper limb sensibility to brush and pin-prick was diminished up to the level of the acromion process behind and to the lower margin of the deltoid muscle in front. Thermal sensibility was lost completely in the left hand and back of the left forearm and very much diminished throughout the rest of this arm. Vibration sense was diminished throughout the left leg, left anterior superior iliac spine, left forearm, right wrist, and over the vertebral spines from the second dorsal downwards. (With the exception of vibration in the right wrist the sensory changes in this case were unilateral.) The knee-jerks were much exaggerated and patella clonus was present—a little more easily obtained on the right side. The ankle-jerks were much exaggerated and clonus was present, slightly more marked on the right than on the left. Both plantar responses were extensor. There was a slight Oppenheim's reflex on the right side. Epigastric and abdominal reflexes were absent. Arm-jerks were all exaggerated, rather more so on the right side. The spinal level diagnosed was the fifth cervical segment. A small portion of the lipiodol injection passed right down to the lower limit of the meninges, the bulk, however, remained in the cisterna magna with a portion extending down to the middle of the body of the axis. Twenty-four hours later there was practically no change, so that an almost complete "spinal block"—the upper limit of which was at the middle of the body of the axis—was indicated.

Commentary.

These cases were operated upon under intrapharyngeal nitrous oxide oxygen anæsthesia. The operative technique and the after-treatment were essentially the same as described in our previous communication, except that in Cases 1 and 3 the dura mater was left open after removal of the tumour. In the case of the dumb-bell tumour (Case 3) only the intrathecal part was removed, it being intended to remove the extraspinal portion at a subsequent operation, but the patient continued to vomit after the operation and died rather suddenly 15 hours later. The autopsy revealed the cause of death to be acute dilatation of the stomach, the stomach almost filling the abdomen. The prognosis in the other two cases was considered rather unfavourable on account of the previous cardiac failure and the cystitis in Case 1 and the severe cystitis in Case 2. Both, however, stood the operation well and slowly and steadily improved afterwards.

In Case 1 the patient began to have some return of feeling in the right foot within a week of the operation, and ten days later she was able to feel both her feet and legs being touched with the hands. Three weeks after the operation the tight band-like feeling around the waist had disappeared and she was able to flex the right ankle and knee and flex and extend the toes. Both legs, however, were rather painful and somewhat more spastic than before the operation. Three and a half months after the operation she had regained complete control of the sphincters and she began her first attempts at walking again. By this time the stiffness in the legs had considerably lessened, but occasional flexor spasms occurred. When last seen, eight months after the operation, this patient was able to flex and extend the legs fully, although with some effort, for there was still some spasticity and adductor spasm. She was able, with some assistance, to take short walks daily, but when walking she kept her knees rather flexed and took short steps. Sensation had completely returned except for some diminution of vibration sense in the left ankle, diminished thermal sensibility in the sole of the left foot, and absent joint sense in the left great toe. Flexor spasms of the legs were still troubling her, particularly at night, and a slight feeling of constriction was present around the waist. The left plantar reflex was doubtfully extensor.*

In Case 2 sensation commenced to return in the legs two days after the operation. Within ten days he was able to draw the right leg up and could feel a pin-prick in this leg distinctly. A week later he could feel a pin-prick in the left leg and deep pressure in both, and two days later he began to regain control over the bladder. About ten weeks after the operation he could move both his legs, but spasticity had increased. A month later the spasticity had become very marked and adductor spasms so troublesome—his legs remaining crossed—that orthopædic treatment was decided upon. The right obturator nerve was cut, tenotomy of the right adductor longus was

* Two months later her condition generally had greatly improved and she could walk much more freely without assistance.

performed, and the remaining adductors and hamstrings on both sides were stretched. These measures effectively corrected the "crossed-leg" deformity, but some contraction of the hamstrings persisted. Within a fortnight, however, he was able to lift both legs off the bed and move them at all joints. He had now, also, complete control over the bladder. Progress in walking continued slowly but was considerably hampered by increasing contracture of the hamstring muscles, preventing him from straightening his legs. Consequently, some eight months later, further orthopædic treatment was undertaken. Tenotomy of the hamstrings on both sides was performed and the legs were put up in plaster, fully extended, for three weeks. At the end of this period he commenced walking again, was able to stand erect, and soon was getting about with much less fatigue and more comfort. The bowels and bladder were acting normally. When last seen —some 15 months after the removal of the tumour—he looked and felt very well indeed. He was able to walk erect and quite smartly but with just a suggestion of stiffness at the knees. He had no tingling, pains, or spontaneous flexor spasms in his legs and no tightness around the body. He had complete control over his sphincters but constipation was rather troublesome. While the legs showed spasticity in extension, he could flex and extend them easily at all joints. The knee-jerks were exaggerated and equal, and ankle-clonus was present on both sides. The plantar responses were slightly extensor. Sensory recovery was marked. Sensibility to pin-prick had completely recovered. Thermal sensibility also was normal, except for a zone of slight diminution encircling the body from the level of the nipples to that of the ensiform cartilage. Sensibility to the brush was still diminished, but only slightly so, in the legs and trunk up to about the seventh dorsal spine behind and the nipples in front. Vibration sense was still slightly diminished from the knees downwards, a little more so in the right leg than in the left.

Clinical and Laboratory Notes.

A NOTE ON THE PRESENCE OF ANTIBODIES TO HERPES VIRUS IN POST-ENCEPHALITIC AND OTHER HUMAN SERA.

By C. H. ANDREWES, M.D., M.R.C.P. LOND.,
MEMBER OF SCIENTIFIC STAFF, NATIONAL INSTITUTE FOR MEDICAL RESEARCH;
AND
E. ARNOLD CARMICHAEL, M.B., M.R.C.P. LOND.,
CHIEF ASSISTANT, PROFESSORIAL MEDICAL UNIT, ST. BARTHOLOMEW'S HOSPITAL.

Two main theories concerning the ætiology of encephalitis lethargica are current. Some hold that the disease is caused by the virus of herpes simplex, which under exceptional circumstances becomes neurotropic in man. This view is based on the occasional recovery of herpes virus from the brains of patients dead of encephalitis lethargica and on the fact that herpes virus can produce not only an acute or chronic encephalitis in rabbits, but also, as Zinsser [1] has shown, a chronic encephalitis in certain monkeys which is not unlike encephalitis lethargica in man. Others, however, are unconvinced by this evidence and maintain that the cause of encephalitis lethargica is an unknown specific neurotropic virus. (See Zinsser's [2] recent review of the problem.)

It seemed that some light might be thrown on the ætiology of encephalitis lethargica by examining sera from post-encephalitic patients for antibodies to herpes. If herpes virus were the causal agent of encephalitis lethargica, antibodies might be expected to be present in view of the following considerations. First, many neurologists believe that post-encephalitic parkinsonism is a manifestation of a chronic infection with the agent of encephalitis and not a mere residuum due to destruction of nervous tissue. Secondly, rabbits infected with herpes, including those suffering from a chronic form of encephalitis, possess neutralising antibodies in their serum. Flexner [3] reported in 1923 that convalescent epidemic encephalitis serum was somewhat more protective against herpes virus in rabbits than were a few samples of normal human serum. Since our investigation was begun Zinsser and Tang [4] have published the results of a study on the same lines. They found that 39 of 45 post-encephalitics (86·7 per cent.) had antibodies to herpes in their serum, while only 11 out of 17 adult controls (64·7 per cent.) showed antibodies. Normal children gave an even lower percentage of positive results (43·4 per cent.). Zinsser and Tang were naturally reluctant to draw conclusions from these figures. They tested for anti-herpes properties in sera by incubating the serum to be tested with 2 to 4 minimal lethal doses of virus and inoculating rabbits intracerebrally. This method, though it apparently gave consistent results, is expensive in animals and allows very little margin for possible variation in the susceptibility of the rabbits.

Our investigations were undertaken because we had at hand a simple method of testing for antibodies to herpes. We found, as Gay and Holden [5] and Wilson Smith [6] have done, that some strains of herpes give very satisfactory lesions when inoculated intradermally into rabbits, and that with such a technique sharp neutralisation of virus by immune serum can be shown. We used a strain (E.L.i) kindly given to us by Dr. J. R. Perdrau; this at first gave unsatisfactory intradermal lesions, but after a few passages in tissue cultures was very satisfactory for our purposes. The virus multiplied readily in cultures of rabbit testis in dilute rabbit serum, as lately described by one of us (Andrewes [7]). Fluid from tissue culture was mixed with an equal volume of immune serum, and after a few minutes' contact at room temperature, 0·1 c.cm., was inoculated intradermally.

Results.

Human sera were found to fall sharply into two groups. Either they did not influence at all the size of the lesion produced by the virus, or they neutralised a thousand infective doses completely. It will be seen from Table I. that 21 out of 28 (or 75 per cent.) control sera contained antibodies to herpes; such antibodies were less evident in the few sera examined from normal persons, chiefly medical students, than in sera of assorted hospital patients, but the possible significance of this difference has not been further studied. In Table II. are set forth the results of testing the sera of 25 post-encephalitic patients; brief details are given of the history of their disease. Antibodies were found in the serum of 18 out of 25 patients (or 72 per cent.), approximately the same percentage as in the control group.

All the patients whose serum was tested were asked whether or not they had ever suffered from "herpes simplex," the nature of which was described to them. Very few replied in the affirmative, but it is not felt that much reliance can be placed upon the answers obtained. In addition to the unselected group of normals in Table II., sera were examined from seven subjects, all workers at the National Institute for Medical Research and all liable to frequently recurring attacks of labial herpes. Antibodies were present in all seven of these sera. It is of particular interest that one of them had had an attack of herpes six days before he was bled, while another had an attack four days after blood was taken. Herpes simplex is one of the few known virus

diseases which does not lead to lasting immunity at least in man. It appears from these observations that in some obscure way herpes can recur in man despite the presence of antibodies in the serum.

TABLE I.—*Antibodies to Herpes in Control Sera.*

Case.	Age.	Sex.	Present condition.	Antibodies to herpes.
1	44	M.	Gastric ulcer.	+
2	57	M.	Colitis.	+
3	27	M.	Hysterical palsy.	+
4	17	F.	Nephritis.	0
5	23	M.	Pneumonia.	+
6	59	M.	Tabes dorsalis.	+
7	14	M.	Dyspituitarism.	+
8	18	M.	Chorea.	+
9	52	M.	Arthritis.	+
10	Ad.	F.	Gynæcological patients.	+
11	,,	F.		+
12	,,	F.		+
13	,,	F.		+
14	,,	F.		+
15	,,	F.		+
16	50	F.	Syph. and herp. zost.	+
17	55	F.	Cerebrovascular disease.	+
18	38	M.	Mediastinal sarcoma.	+
19	Ad.	F.	Nephritis.	+
20	18	F.	Pneumonia.	+
21	59	M.	Cerebrovasc. syph.	+
22	38	M.	Gastric ulcer.	+
23	Ad.	M.	Normal.	0
24*	,,	M.	,,	0
25*	,,	M.	,,	0
26*	,,	M.	,,	0
27*	,,	M.	,,	0
28*	,,	M.	,,	0

* Medical student. Ad. = Adult. There was no history of herpes simplex in any patient except Case 22 and a doubtful history in Case 19.

TABLE II.—*Antibodies to Herpes in Post-encephalitic Sera.*

Case.	Age.	Sex.	History of encephalitis lethargica.	Onset of parkinsonism.	Date of taking serum.	Antibodies to herpes.
29	51	M.	Spring, 1920.	March, 1929	—	+
30	22	M.	July, 1923.	1926	—	0
31	21	M.	June, 1925	1925	—	+
32	31	F.	Jan., 1925.	1927	—	+
33	26	F.	? 1924.	1924	—	+
34	45	M.	? 1924.	1925	—	+
35	24	M.	Nov., 1924.	1925	—	+
36	44	M.	June, 1918.	1926	9/1/30 19/2/30	+
37	35	M.	? 1924.	1925	—	0
38	21	M.	Dec., 1919.	1926	—	0
39	41	M.	? 1924.	1925	—	—
40	16	M.	June, 1925.	1928	—	0
41	22	F.	1923	1926	—	0
42	41	F.	1925	1927	9/1/30 19/2/30	+
43	31	M.	1927	1927	—	+
44	23	M.	May, 1925.	1925	—	+
45	30	M.	May, 1925.	1926	—	+
46	24	M.	July, 1924.	1927	—	+
47	36	F.	1926.	1926	—	+
48	46	M.	1925.	1925	—	+
49	30	F.	1924	1927	21/11/29 26/11/29	+
50	24	F.	1924	1926	—	0
51	60	M.	1921	1921	—	+
52	35	F.	1925	1927	—	+
53	50	F.	1922	1923	—	0

Parkinsonism was present in all the cases. There was a doubtful history of herpes simplex in Cases 35 and 38, but no history in any other patient.

Yet that serum can prevent the virus from infecting a rabbit's skin or a tissue culture of rabbits' testis.

Summary.

Antibodies to herpes virus were found in the serum of 72 per cent. of 25 patients with post-encephalitic parkinsonism and in 75 per cent. of 28 unselected controls. These observations, therefore, lend no support to the view that the virus of herpes simplex is the essential cause of encephalitis lethargica.

Seven subjects with frequently recurring labial herpes all had antibodies in their sera; the significance of this is discussed.

One of us (E. A. C.) is responsible for the clinical diagnosis of the patients and for obtaining the sera; the other (C. H. A.) for the animal tests. We thank Prof. F. Fraser for permission to utilise the material under his care and Prof. Major Greenwood for kindly examining the available figures. He assures us that statistically there is no significant difference between the post-encephalitic and control sera either in our series or in that of Zinsser and Tang.[4]

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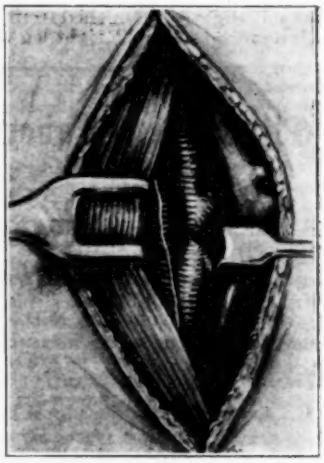
AN IMPROVED METHOD OF LIGATURING THE EXTERNAL CAROTID ARTERY.

BY NORMAN PATTERSON, M.B., CH.B. EDIN., F.R.C.S. ENG.,

SURGEON, THROAT, NOSE AND EAR DEPARTMENT, LONDON HOSPITAL.

IT occurred to me some time ago that the operation of ligature of the external carotid might be simplified. I have on two occasions carried out a modified procedure which I am convinced possesses definite advantages over the classical method. The preliminary stages of the operation are the same as those described in the text-books. The carotid sheath is exposed and incised over the internal jugular vein, which is freed from its fascial covering for a length of from 2 to 3 inches in the neighbourhood corresponding to the region of the carotid bifurcation. The vein is now carefully separated from underlying structures, including the vagus nerve. It is then retracted towards the mesial plane, instead of laterally as in the classical operation, until the bifurcation of the common carotid comes into view. The hypoglossal nerve tends to be retracted forwards with the vein and may never come into sight; of course, care must be taken to avoid damaging this nerve or its branch, the descendens hypoglossi. The actual ligation of the external carotid is carried out at the site of election by adopting the same technique as in the classical procedure. Sometimes it may be advisable to tie the ascending pharyngeal artery. In uncomplicated cases this method is simpler than the older one.



Drawing to illustrate method of ligature of external carotid artery.

Difficulty of the Recognised Route.

The operation by the recognised route may be extremely difficult, where there is a regular plexus of large veins over the bifurcation of the carotid and more especially if in addition there are enlarged glands, the seat of acute or chronic inflammation, possibly associated with adhesions. The veins which

enter the internal jugular in this region from in front vary much in size and arrangement, but the following may be present: the common facial, lingual, pharyngeal, and sometimes the superior thyroid vein. In practically every case they hamper direct access to the external carotid, and frequently more than one vein has to be divided and double-ligatured. The object in tying the external carotid is to diminish the blood-supply to the parts to which this vessel is distributed. Ligature of a large vein such as the common facial to a certain extent defeats that object by increasing the venous congestion.

Two Cases Related.

I will here cite two cases, one where ligation was carried out by the time-honoured procedure, the other where the modified method was employed. The first patient, a woman, was admitted to the London Hospital with the history that her medical attendant had incised a peritonsillar abscess on three occasions. She had lost a large quantity of blood, and bright blood was still oozing from an incision in the neighbourhood of the right tonsil. The hæmorrhage could not be controlled at its seat of origin, and I decided to ligature the external carotid. The operation was much complicated by an acute inflammation of the glands and periglandular tissues in the upper part of the neck, and a plexus of veins over the region of the carotid bifurcation. Moreover, the veins were difficult to define and their walls were very friable. On account of these conditions the operation was extremely difficult. The external carotid was eventually ligatured and the hæmorrhage from the pharynx immediately ceased and did not recur.

Recently I was called to the London Hospital on account of severe hæmorrhage from the pharynx in a patient who had been treated for sarcoma, originating in the right tonsil and accompanied by secondary involvement of the cervical glands. The patient, a man of 25, was in a very critical condition. Bleeding was taking place from an ulcerated area on the right side of the pharynx. The hæmorrhage was evidently arterial. It could be controlled by a swab firmly held over the spot, but the instant this was removed it recurred with such vigour that it would have been futile to try to find the bleeding vessel. I therefore decided to ligature the right external carotid. The case had been under treatment for a long time with X rays and a month previously with radon needles, and considerable fibrosis of the tissues of the neck had taken place. It was anticipated that the operation would be difficult, and as the patient was in a state of collapse from loss of blood following an exhausting disease, it was thought necessary to carry out the operation as quickly as possible. (Mr. J. H. Challis with great skill, under light anæsthesia, managed to pass an intratracheal catheter while the patient was still bleeding profusely.) Once the catheter was in position it was a matter of no great difficulty to control the hæmorrhage and—notwithstanding the matting of the tissues—to expose the external carotid, adopting the route I have suggested, and place a ligature round it. The carotid was the only vessel of any size which was ligatured during the operation.

A week later alarming hæmorrhage recurred. In my absence my colleague, Mr. Charles Donald, kindly dealt with the emergency. He has furnished me with the following notes:—

"Under circumstances of great difficulty, with an assistant compressing the bleeding point by a finger within the mouth and frequent alterations in the position of the head of the patient—necessitated by the anæsthetist when swabbing out the pharynx in order to keep the airway clear—I endeavoured to tie the left external carotid in the classical way through an incision in its line with the midpoint about level with the great cornu of the hyoid. On cutting through the fascia in front of the sternomastoid, I experienced great difficulty in making out any further plane owing to dense fibrous matting of the tissues caused by previous X ray and radium treatment. The internal jugular vein was then met, very adherent to surrounding structures. During the process of separation from these, the vein or its tributaries was torn in two or three places, and on retracting it backwards only a very limited view of the deeper structures was obtained. An artery was found which appeared to be in the position of the external carotid, although this could not be absolutely confirmed. As the patient was in extremis and the anæsthetist wished him off the table at once, I tied it without further investigation. It was found post mortem to be the internal carotid."

These cases illustrate the advantage of approaching the vessel by the route I adopted in the second patient.

TONSILLECTOMY BY DIATHERMY, USING SURFACE ANÆSTHESIA.

By Warner Collins, M.D. Lausanne, B.Sc. Lond., D.M.R.E. Camb.,

HONORARY RADIOLOGIST TO THE WEIR HOSPITAL AND ST. JAMES' HOSPITAL, LONDON.

The comprehensive list of diseases for which tonsillectomy is now advocated and the large variety of organisms which show an undoubted preference for this area explain why the tonsil has assumed importance as the most common origin of general ill-health. Tonsillectomy is the most commonly performed of all operations. It is widely regarded as an essential step in the treatment of many cases of gastro-intestinal disease, gall-bladder troubles, rheumatic affections, eye and ear disease, skin conditions, nervous complaints, and most blood diseases, since it limits the downward spread of infection through the alimentary tract. Further, it is universally agreed that tonsillectomy must mean the eradication of the entire tonsil, which must be removed, together with the so-called capsule of connective tissue.

We are now taught to rely solely on the slow, blunt dissection method. This is admittedly a method which, apart from the skill and time required, necessitates a long and very deep anæsthesia which, to my mind, is a dangerous and unnecessary risk. The snare and the guillotine, according to present-day literature, too often leave behind a considerable portion of lymphoid tissue, which continues to grow, causing further pathological difficulty. Apart from the anæsthetic risk, many patients are unsuitable for this method of treatment on account of fear or age or some other factor predisposing to surgical shock. Other methods of eradication are: local applications, X rays, radium, the simple cautery, and diathermy. Both with X rays and radium a definite shrinkage of all lymphoid tissue generally does occur with accurate dosage. In the tonsils, however, there is a concentration of lymphoid tissue within a relatively small area, so that the mucous membrane has become invaginated with numerous crypts. The end-result of such treatment is a shrunken but fibrous tonsil, which provides a focus for further infection. Pathogenic organisms have repeatedly been detected in the crypts after treatment by X rays and radium. The method of irradiation cannot be sufficiently localised in its application to avoid the possibility of seriously affecting the activity of the thyroid-parathyroid mechanism or other neighbouring structures, not to mention the well-known risk of radiation dermatitis. The simple or electric cautery involves pushing a heated metal electrode through tissue which rapidly conducts away the heat and so limits the effect to a very small zone around the electrode. To my mind this method is practically useless, since the operation is of necessity incomplete and there is a great risk of secondary hæmorrhage.

Diathermy needs no general anæsthetic, causes no shock of any kind, entirely eradicates the tonsil, and carries no risk of hæmorrhage, primary or secondary. Heat, sufficient to destroy the tissue, is actually generated in the tonsil itself and this heat can be controlled at will. A considerable zone can be operated from a single point; the largest tonsil can be treated from two points of application, while the vast majority can be destroyed as one single unit. In happy contrast with the older cautery method, there is no complete katabolism of tissue protein, since the process stops short at the stage of coagulated protein. I think the consequent absence of toxic shock worthy of mention.

The Technique Described.

The technique I now describe has been evolved as the result of observations on more than 150 tonsillectomies on adult patients which I have done

within the last four years. I do not think the method so suitable to children under 14 years of age, since to them a general anæsthetic is usually less alarming than the appearance of electrical apparatus. The process here called diathermy is strictly a combination of true diathermy and fulguration. Broadly speaking, the stage of true diathermy coincides with the production of sufficient heat within the tonsil to kill the tissue and boil contained liquids. Fulguration is the condition of electrically "arcing" off the surface of the tonsil in order to seal efficiently and permanently both arteries and lymphatics. There are no contra-indications to this method which would not apply to the simplest of surgical operations. The general health of the patient should be noted and oral sepsis eliminated as far as possible. As already mentioned, each tonsil is surrounded by a maximum surface of mucous membrane, and this fact ensures the success of cocaine spray anæsthesia. No general anæsthetic has ever been required and, of course, the use of ether would be precluded by the presence of high tension electricity. I have found it quite unnecessary to inject cocaine, and it has always been sufficient to spray the throat with not more than 2 grains of cocaine hydrochloride freshly dissolved in two drachms of water.

The tonsillar electrode is usually a small metal ball mounted on a curved insulated handle of ebonite. A variety of holders have been constructed to cope with any angle of application. As the result of experiment, no advantage was found in using more than one indifferent electrode, and finally a sheet of thin lead, 8 in. by 6 in., has been selected as standard; it is covered by four thicknesses of plain lint saturated in 20 per cent. salt solution. This electrode is securely strapped to one wrist and bears a large M.S.A. diathermy terminal. The frequency of oscillation of the diathermy machine is not at all critical, and the several well-known makes of apparatus which I have tested all gave excellent results with a diathermy current of two amperes. This current can constantly be obtained once the necessary setting for the particular machine has been determined and, when used with the resistance of an average patient, rapidly causes a rise of temperature in the tonsil to approximately 100° C. As soon as anæsthesia is complete the indifferent electrode is fixed to the forearm, the patient comfortably seated in a supporting chair, and the tongue depressed by means of a glass spatula. The active electrode is then placed in firm contact with the tonsil and the current switched on. The tonsil soon shows, radiating from the centre of the active ball electrode, a zone of coagulated tissue, which rapidly desiccates. Complete destruction of the tonsil is effected slightly beyond this area of coagulation. The whole process lasts but a few seconds, after which the active electrode is deliberately arced a few times from the surface of the tonsil in order to seal any vessels. It may be a little difficult at first to determine the depth to which coagulation has taken place, especially if the operator is unfamiliar with more general surgical diathermy. Much useful information was acquired by the writer from sections of raw beef treated with varying electrodes and intensities. It is occasionally advisable to complete the tonsillectomy in two, or very rarely, three, stages, but this only applies to very large tonsils, or, alternatively, to extremely nervous patients.

Post-operative Procedure.

The patient is invariably seen at the end of a month, and again after three months. Should a fragment of lymphoid tissue have escaped, it is, of course, removed at this stage. There is no need to hospitalise the patient and the discomfort is relatively slight. The operation is practically painless. During the 36 hours or so following the treatment the peritonsillar tissue becomes œdematous, which I believe to be the rule in all operations involving mucous membrane. A suitable hypnotic such as Allonal will ensure the first night's sleep. I find approximately 20 per cent. of cases show a rise in temperature, which rapidly subsides in a few hours, and for this reason I have lately ordered all patients to remain in bed for 48 hours after operation. An antiseptic mouth-wash is ordered to be used after each meal, but gargling is absolutely forbidden, lest undue strain be placed on the throat. The coagulation slough commences to separate in a few days and the process continues for about ten days or a fortnight. During the latter part of this period the slough may prove slightly malodorous, but this does not seem to be realised by the patient, and of course disappears with the departure of the slough. Secondary infection of the slough or underlying tissue has not occurred in any instance. The general reaction always remains slight and the local disturbance reasonable. No secondary hæmorrhage has occurred throughout this work. A soft glassy scar, with practically no contraction of tissue, invariably results, and is assumed to be evidence of a downgrowth of epithelium.

I believe that this application of diathermy to tonsillectomy possesses at least all the advantages of other methods, and yet none of their disadvantages.

Medical Societies.

HARVEIAN SOCIETY.

AT a meeting of this Society on April 10th, with Dr. P. MONTAGUE SMITH, the President, in the chair, Sir THOMAS HORDER opened a discussion on

HIGH BLOOD PRESSURE.

His interest in the subject, he said, was chiefly clinical; he differentiated between three types of case. In the first group he placed those patients with evidence of definite organic disease due to arteriosclerosis or atheroma—i.e., those in whom there was diffuse arterial degeneration. This was the largest group of the three. Patients with this type of high blood pressure showed associated changes in the heart and kidneys, and later developed the renal condition severally termed granular kidney, interstitial nephritis, and gouty nephritis. Symptoms were protean and included heart failure, angina, renal insufficiency, retinal changes, hæmorrhages, thrombosis, and uræmia. Prognosis and treatment were less hopeful with this type of case than with the others, and it was important to assess the state of the myocardium. The second group was also the next largest. It comprised those cases in which the onset of symptoms and the development of high blood pressure were associated in the mind of the doctor, but in which there was no certain evidence of organic change in the heart, kidneys, or blood-vessels. These cases he classed as hyperpietics, but the line dividing them from the arteriosclerotic type was indefinite. Finally, there was a small group in which the renal element was dominant; there might be a mixed nephritis or frank parenchymatous nephritis. The patients were usually women in the late thirties with a blood pressure registering 240 to 300 systolic and 120 to 150 diastolic. They had albuminuria, retinal changes, and no œdema; they usually died in uræmia.

Hyperpiesia.

The cases in the second group might be subdivided into five minor classes. First, the plethoric type of man of sedentary habits, with a tendency to overeat. Hypertension in these cases might be in some degree compensatory to cope with increased metabolism. Secondly, there were cases where hypertension was due to some exogenous poison, the commonest of which was alcohol. Thirdly, there were menopausal cases. Women in the late forties often entered on a stage of hypertension which might last some months or years and then, gradually or occasionally suddenly, subside. At one time he had thought a systolic pressure of 175 the limit beyond which these cases should be considered pathological, but he had seen women with a systolic pressure of over 200 emerge from this phase, and he was no longer prepared to set a definite limit. The diastolic pressure did not rise pari passu with the systolic in this group, and the

greater the lag the better the prognosis, since the diastolic pressure represented the permanent strain on the heart and vessels. Men often seemed to go through a similar phase of hypertension, but later in life than women. Boys at puberty often experienced a similar rise in pressure, especially those boys in whom the heart had given cause for concern. Some cardiologists said that they could detect thickening of the brachial arteries in these cases but he did not know how they did it. He considered that the rise in tension might be a compensation for heart strain, since he was not one of those who held that the heart could not be strained by exercise. Fourthly, there was a group of nervous hyperpietics. In many of these the patient's knowledge of his high blood pressure helped to keep it high. Good effects could be got in these cases by encouraging equanimity. Finally, were there possibly cases which might be called essential hyperpiesia? Such patients had a blood pressure of 200 systolic, 100 diastolic, all their lives, without evidence of toxic or other causes. They complained of headache, giddiness, and lassitude. If these cases were understood they might help to explain raised arterial tension in general. Were they, perhaps, the expression of an endocrine disturbance, and, if so, of the adrenal or the pituitary, or both?

The will-o'-the-wisp of focal sepsis had received much attention in cases of hyperpiesia. A diffuse sepsis might also be considered, affecting the whole of the upper respiratory passages or a large section of gut. The evidence was elusive. Our predecessors who called these patients gouty were as near the truth perhaps as ourselves in our eternal search for sepsis.

Exacerbations of symptoms occurred from time to time, accompanied by waves of hypertension. Intensive treatment should be undertaken during these attacks. The prognosis was serious until organic disease was excluded; even then a patient with high tension could not be regarded as a good life. He disliked any case in which physical examination failed to reveal anything abnormal, and if there was a family history of arterial disease he liked it even less. A man was not only as old as his arteries, but his arteries were the resultant of the arteries of his forbears.

Treatment.

Early diagnosis of high tension should lead to prophylactic treatment. It was impossible to change a temperament, but strains and stresses could be diminished. Reassurance in these cases was a form of treatment, and, if accepted, often caused a fall in tension. It should be explained that high blood pressure was not a disease but a symptom, and probably a valuable adjustment. Rest and diet must have their place; it was less important to limit the diet in any particular than to reduce the whole amount taken. Much fluid should be avoided, since water was secreted by the kidneys, not merely diffused, and therefore threw more work on them. Portal depletives such as mercury and salines were valuable, and constipation should be corrected. Warm baths and high frequency had their place, and venepuncture was valuable during exacerbations; he preferred to remove 50 to 100 c.cm. of blood daily for a few successive days rather than to take a larger quantity on a single occasion. Drug treatment included iodine, iodides, and occasionally nitrites. Digitalis was often helpful; in these cases the heart often needed tonics when it was erroneously imagined that depressants were required. Anabolin were still on trial but had given no impressive results so far. Thyroid and bromide were useful for menopausal and nervous cases. For each individual the state of the heart, the kidneys, the vessels, the nervous system, and the tissues must be assessed. Success depended on the care given to the individual case.

Discussion.

Dr. GEOFFREY EVANS agreed with Sir Thomas Horder that it must be decided in every case whether the condition was functional or organic, but he doubted whether a distinct line could be drawn between the two. In the menopausal cases he had found that the blood pressure rose, and then either returned gradually to normal, or remained high and increased, or else fell below normal and remained there. The first of these courses he regarded as indicative of functional disease, the second of organic. The ætiology was the same; possibly some pathogenic agent caused a simultaneous change in function and in structure, but one change might outbalance the other. The prognosis was better when structural changes were not apparent. The cause of the condition should always be sought. He described the case of a medical student who at the age of 19 was told by one doctor that he had a high blood pressure, and by four that he had not; he lived a tranquil temperate life to avoid arterio-sclerosis, and at the age of 48 had a systolic pressure of 240 and a diastolic of 120. He had been developing this hypertension gradually, without any cause being discovered. Progress of the disease was in waves—stationary phases followed by exacerbations. Sir Clifford Allbutt had given the name of hyperpiesia to those cases with persistent high tension and without uræmia in whom death usually occurred from cerebral hæmorrhage. These were the cases which did not respond to rest and diet. At about 35 they began to develop retinal hæmorrhages; a few years later renal symptoms appeared, and at 45 they gave the typical picture of chronic interstitial nephritis. They died of uræmia, cardiac failure, or hæmorrhage. As structural and renal changes developed the prognosis became worse, but even in the absence of such changes death might occur from cerebral hæmorrhage.

Dr. J. F. HALLS DALLY said that hypertension was a symptom of many causes; it was therefore difficult to formulate a scientific treatment. Overfeeding led to the retention of waste products which were not easily secreted by the kidney. According to the French school the liver was an important detoxicating agent; he considered that in this condition the liver dysfunction was part of the general condition. Exercise was more important to restore its action than cholagogues or salines. Control of the condition should be aimed at rather than treatment. The patient should regulate his life and his diet; meat appeared to have no effect on the damaged kidney, and provided the diet was adapted to the minimum metabolic level it need not be otherwise altered. As to intestinal toxæmia, the only toxin which had so far been investigated had a depressor, not a pressor, action; oral sepsis was more important. He did not agree that a man was as old as his arteries; many patients with seriously diseased arteries lived for years. The renal condition had much more effect on the prognosis. Attempts at reduction of pressure by drugs were usually dangerous; in most cases the high pressure was essential for kidney secretion. The diastolic pressure was more important than the systolic because it was more constant and less affected by emotion. A diastolic pressure of more than 120 was usually indicative of disease of the kidneys. Apoplexy usually occurred, not in those cases with the highest pressures, but with those between 160 and 190 systolic. He only used venesection as an emergency measure, and starved the patient for three days afterwards. He had had no good results with anabolin, and all the results to be obtained from potassium iodide could be obtained equally well with French tincture of iodide. The iodine, not the potassium, was important.

Dr. A. H. DOUTHWAITE said that reassurance was not sufficient treatment for a patient during an exacerbation, and the symptoms must be relieved by reduction of pressure during the attack. He had found iodides, nitrites, bromides, and anabolin to be valueless. Thyroid and dieting had been useful in menopausal cases. In other cases he had found that venesection every two or three months worked well and relieved symptoms. At Guy's Hospital intramuscular injections of acetylcholine in doses of 0·1 g. were being given; a course of this treatment

effected a reduction of pressure with relief of symptoms lasting for a period up to six weeks. He thought that intestinal toxæmia was associated with high blood pressure in those cases with fœtor oris and sallow complexions, since these symptoms always increased during exacerbations. Experiments on intestinal toxins had been carried out by injection of a dose of the toxin into an animal; the fact that no rise in blood pressure resulted gave no indication of what would result from chronic intoxication. These substances might act by causing an hypertrophy of the suprarenal medulla, with increase of circulating adrenalin. A similar mechanism was at work during the menopause, when the ovarian hormone failed to exert its counteraction on the suprarenals, and accounted for menopausal hypertension.

Dr. ADOLPHE ABRAHAMS said that the school of Lewis did not hold that the healthy heart could be strained by exercise, but the toxic heart might. Might not some of the boys at puberty seen by Sir Thomas Horder be cases of veiled renal disease? The subject would be less involved if the height of the blood pressure was always correlated with the symptoms. He took it that Sir Thomas Horder agreed that practitioners must insist that hypertension should not be considered to be arterio-sclerosis in every case.

Dr. GILBERT ORME said he had seen many cases of transient hypertension during the late forties among male mill hands in the North of England. In all the cases which survived normal tension was regained after about two years.

Dr. R. COVE-SMITH said that probably everybody had his own normal standard of blood pressure, and no definite line should be drawn in deciding where abnormal pressures began. He found it difficult to bring increased tension into line with cardiac strain as a compensatory mechanism. Digitalis was a useful stimulant to the myocardium in cases of hypertension, and he knew of no evidence that it increased the blood pressure in the normal man.

Reply.

Sir THOMAS HORDER said that he could not prove that his young boys were not cases of potential nephritis, but he had never heard of any nephritic developments later. Changes in the vessels were not necessarily an indication of their condition; they might be healed, in which case the man was as young as the repair of his arteries. He treated his patients during exacerbations, not with reassurance merely, but with rest in bed, a vegetable, fruit, and milk diet, a fast day once a week, intensive iodine, and venesection. As to heart strain, if Dr. Abrahams would watch the finish of the boat-race he would see the text-book picture of heart strain among the rowers: pallor, dyspnœa, and the typical facies. If the coronary circulation was under the same control as the general circulation, then hypertension might very well be compensatory for heart strain by increasing the blood-supply to the myocardium.

BRISTOL MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society held on April 9th, Mr. C. FERRIER WALTERS, the President, being in the chair, Dr. A. D. FRASER read a paper on the

CAUSAL ORGANISM OF ACUTE RHEUMATIC FEVER

and its relationship to chronic rheumatism, cancer, and other diseases. An investigation into the pathogenesis of acute rheumatic fever had, he said, culminated in the isolation of a causal organism and the reproduction of the disease in animals. The organism had a very complicated life-history and had been found associated with many other diseases of obscure origin. It was seen in an Aschoff nodule as a nuclear body occurring singly or in pairs like dumb-bells, giant pneumococci, or a cottage loaf. It might be surrounded by a clear halo, as if encapsuled. The staining reaction to hæmatoxylin varied, being sometimes dense black, sometimes light brown. It could not be identified by special stains. A Gram-positive coccus had been isolated from a case of rheumatism. It grew well now on weekly subculture and required no special media. It was non-hæmolytic and formed acid with glucose, lactose, maltose, saccharose, and salicin. It acidified and clotted milk and produced small, uniformly pink colonies on bile agar. On nasgar the colonies were moderately large, rather opaque and moist, with even edges. It looked the same after repeated subculture as it had at first. It gave the impression of reproducing by budding. Cultures had been injected intravenously into rabbits and had caused no obvious symptoms beyond wasting, but the animals had died in less than eight weeks. Autopsy revealed large firm vegetations on the mitral and aortic valves and small white areas in the kidneys. Microscopically there was marked interstitial fibrosis of the inner half of the myocardium and the papillary muscles. In the outer half there were small focal areas of cells amongst disintegrated muscle-fibres; these consisted of large irregular cells with densely staining nuclei together with the cottage-loaf cells. The vegetations on the valves consisted of masses of cocci, mostly Gram-positive. There was, however, no inflammatory reaction in the underlying tissues. The renal abscesses proved to be more in the nature of infarcts, but no cocci were found in them. Culture produced a pure growth of the same coccus as had been injected, and this culture produced the same lesions when injected into another rabbit. The lungs showed rheumatic pneumonia and two curious types of structure lying in the small arteries or capillaries. One type was an irregular mass of nuclear material without definite structure, with rounded, clearer, bulging ends. Their appearance suggested sporulating hyphæ of some kind of fungus. Some of them clearly showed the conjugation of two cells within a capsule, one smaller than the other. The other type was a mass of acidophil cytoplasm containing small particles of nuclear material of irregular shape and size. Around these structures was marked endothelial proliferation, while the alveoli contained many cells and sometimes fibrinous exudate, together with many cottage-loaf cells and cells with budding nuclei spores.

Dr. Fraser then described the post-mortem findings in a case of chronic rheumatic fever which died during an acute attack. The large bowel had shown acute hyperæmia with black ridges running along the mucosa in the long axis of the bowel and scattered ulcerated areas, covered by a yellowish-brown thin membrane. Examination of smears from the ulcers had shown the usual flora with a predominant large bacillus, varying in its reaction to Gram stain. Among masses of mononuclear cells in the bowel wall had been polymorphonuclear leucocytes and cells with the budding nucleus. There were also large diplococci, some of which took Gram stain. Two fungi had eventually been isolated from the ulcers.

The Oömycete and the Ascomycete.

One of these fungi, an oömycete, was parasitic on the other, an ascomycete. The latter had not yet been obtained in pure culture. *Ascomycetes rheumaticus*, as he called it, grew well on all ordinary media and was a facultative anaerobe. It formed acid in glucose but had no effect on other sugars. In milk it caused a slight acidity and opalescence. It did not liquefy gelatin. Its colonies on nasgar were large, smooth, and waxy with irregular edges, and after some time hyphæ grew down into the medium. For the first day or two the cultures were like budding yeast cells, but longer oval cells appeared later and long septate branching hyphæ with large rounded cells at their ends. Occasionally two cells could be seen united by a conjugation tube. Similar cells were found in the lungs of rabbits injected with this organism; the animals died within a week, with nodules in the heart, kidney, brain, and intestine.

Oömycetes rheumaticus reproduced itself by oöspores and zoöspores. It fermented glucose, lactose, mannite, salicin, and maltose, and acidified and clotted milk. It grew well on most media, but not on carrot, unlike the ascomycete, and was a facultative anaerobe. It was a slender, septate, filamentous organism, rapidly breaking up into coccal bodies and motile bacilli in culture. In shake cultures of glucose nasgar the medium was blown apart as if with *Bacillus welchii*. Rabbits died in a few days when cultures were injected; their lungs showed many small mononuclear cells staining sky-blue with Leishman's stain. The organism was found in the blood and lung juice, and when cultured thence usually produced colonies of bacilli and cocci. The oömycete thus had a sporulating hyphal stage. It also had a gametophytic stage which was seen in the meninges and cortex of infected animals. When the gametophytic nodules were cultured in broth, numerous motile short, fat, Gram-positive bacilli appeared. These lost their motility, became Gram-negative, and split into small Gram-negative diplococci. The bacillus formed acid and gas in glucose, lactose, mannite, maltose and salicin, and acidified milk but did not liquefy gelatin. On nasgar it formed large, smooth, glistening colonies with a more or less even edge. The small diplococcus produced small opaque yellowish colonies.

Subcutaneous injection was the best method of reproducing the disease, and the result depended on the stages injected. Typical rheumatic endocarditis and pericarditis had been produced. The lungs reproduced the appearances seen in human rheumatic fever and yielded the conjugating cells of the ascomycete. In successful cases the synovial tissues showed cells and structures identical with those formed by the oömycete, and the meninges and bowel also had typical lesions.

The Fungi in Other Diseases.

The sporangial cells and cottage-loaf cells of the oömycete were to be found, said Dr. Fraser, in the tooth sockets in chronic rheumatism, and bacillary filaments and gamete cells in a mucinous matrix might be seen in the cheesy masses in crevices or pockets of the teeth. The organisms had also been found in sinus washings and pus from acute otitis and mastoiditis, in two cases of nasal catarrh, and in almost every case of tonsillitis, and in a number of catheter specimens of urine from cases of infection of the urinary tract.

In polyps and other simple tumours, spores and sporangial cells were always present, while the amount of fibrous mycelium varied. Cancers showed the same features and in addition cyst-like cavities containing variously shaped nuclear bodies within a clear membranous capsule. Tumours with these cysts putrified very rapidly and yielded short, thick, square-ended bacilli having all the culture characteristics of the oöspore bacillus. Sarcomas had been found to contain a predominating number of the tubular mycelial hyphæ. The urine and sputum of cases of neoplasm always contained some of the elements of the oömycete. The fibrous mycelium and oöspores of the oömycete had been found in a collection of gastric ulcers, gall-bladders, vaginal smears, and sputa from pneumonia, as well as in the stools of infantile diarrhœa.

Discussion.

The PRESIDENT congratulated Dr. Fraser on his work. He queried whether there might prove to be some relationship between this oömycete and the streptococci which Rosenow had found so widely distributed. He asked if Dr. Fraser had any idea as to the source or original host of this fungus.

Dr. CAREY COOMBS said that Dr. Fraser's presentation of his views was such as almost to persuade one to believe in this all-pervading fungus. For the present, however, he felt obliged to adopt an attitude of reserve, for the following reasons: (1) He had examined specimens from a considerable number of cases of acute rheumatic infection of the heart and other tissues and the appearances that he had seen were identical with those described by Dr. Fraser. The dumb-bell cells, however, he had regarded as phases in an endothelial reaction to irritation. (2) The experimental lesions that Dr. Fraser showed were similar to those which he (Dr. Coombs) had seen in animals inoculated with streptococci derived from a number of sources both in this country and elsewhere. (3) The indirect evidence in favour of a streptococcal basis of rheumatic infection was, he thought, worthy of note; there was, for example, its relation to tonsillitis, a lesion thought by most observers to be streptococcic in origin. If Dr. Fraser's view that streptococci are but one phase in the life-cycle of a fungus were true, the whole of bacteriology must be rewritten.

Dr. P. WATSON-WILLIAMS expressed surprise that Dr. Fraser should not have found sporangial cells in rheumatic pneumonia, but he recalled that Poynton and other observers had failed to find any organisms in Aschoff's nodules. He had frequently had washings from nasal sinuses examined by direct smears. As a rule nothing but morphological cocci had been reported present, but it was true that occasionally yeast-like bodies had been described in the smears.

Dr. FLEMING asked whether Dr. Fraser's theory helped to explain the peculiar uniformity of the incubation period which followed streptococcal infection.

Dr. ALEXANDER asked if Dr. Fraser thought that this oömycete converted healthy tissue cells into cancer cells.

Dr. R. C. CLARKE found some difficulty in believing that such different diseases as colds in the head, gastric ulcer, erosions of the cervix, and glioma of the brain were merely varying reactions to the same infection.

Dr. A. T. TODD said that by the injection of simple serum in animals similar rheumatic and carditic lesions had been obtained. He suggested that the effects in Dr. Fraser's animals might be due to anaphylaxis. He agreed with Dr. Fraser that there was an antagonism between chronic rheumatism and cancer; why this should be so if the two conditions were caused by the same organism he did not understand.

Reply.

Dr. FRASER admitted that the whole book of bacteriology would need to be rewritten if his observations proved correct; he recalled American observers who had recently shown mutation between bacilli, cocci, and amœboid organisms. He claimed that the typical pericarditis which he had produced by the injection of the oömycete in animals was not produced by an injection of streptococci. All sorts of unknown appearances had been explained by calling them phases in inflammatory reaction or contamination. A few months ago he had described true Aschoff's nodules in the lung. He pointed out that sporangial forms became unrecognisable in dry smears, but showed their definite structure in wet preparations. He was convinced that many cases of pneumonia were due to this mycotic infection; the pneumococci if carefully examined appeared to be in reality oömycetes. Cancer was a fungous growth of oömycetes and ascomycetes; the spermatozoids entered the tissue cells and activated them so that they became cancer cells. He thought he had only got on to the edge of a new group of infecting agents, but at any rate with this fungus he could produce experimental rheumatic lesions in animals. He had never seen anaphylaxis in an animal produce conjugating cells in the lungs.

BURNING A HOSPITAL.—Owing to the Dorset County scheme for a new institution, Yeovil Isolation Hospital, at Windwhistle Bridge, a few miles away, is no longer needed. Having in view the possibility of infection the Town Council decided to burn the building, and last week it was saturated with paraffin and petrol and completely destroyed.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society held on April 11th the chair was taken by Dr. J. J. BUCHAN, the President, and a discussion on

MENTAL DEFICIENCY AND LUNACY IN RELATION TO PUBLIC HEALTH

was opened by Dr. W. M. ASH. The relation between mental deficiency, lunacy, and public health was, he said, of the closest, and any attempt at separation would be generally inadvisable. Up to the end of the nineteenth century mental deficiency and lunacy had been dealt with by nothing more nor less than a brutal prison service, but to-day they were on a par with other public health services, and prevention should start at an early age. The object of child guidance was to unravel the tangle of social, physiological, medical, and psychological conditions which caused a particular child to become a misfit in society. Here was an excellent example of team work. The social, physiological, and medical members of the team were already part of the public health service. The psychological member should also be a part of that service, and his clinic should be a department of the general maternal and child welfare and school clinic. The importance of the early recognition of mental defect was admitted by all, and school medical officers were supposed to be capable of deciding when expert advice was necessary. The expert should therefore be available as part of the school medical staff. The suggestion that mental health in school children should be under an independent mental health service was not a good one. Mental and physical health could not be separated, and a dual arrangement would cause overlapping and unnecessary interference and expense. Nor was there any line of separation between mental deficiency under and over the age of 16. Children under five, children of school age, adolescents, and adults formed a continuous series at any phase of which mental hygiene was and mental treatment might be necessary. The purely legal breaks at the ages of 5 and 16 were fortunately minimised by the happy circumstance that the Chief Medical Officer of the Ministry of Health was also the Chief Medical Officer of the Board of Education, while the Ministry of Health was the parent body of the Board of Control. Similarly, the local medical officer of health was also school medical officer, maternity and child welfare officer, and often mental deficiency officer, and received information from the time of the birth of the child under the Notification of Births Act. This unity of health service provided continuity of supervision throughout life. Again, there was no line of demarcation between the dull and backward and the feeble-minded or between the educable and the ineducable defective, and there was great advantage in having them all under one control. There was, in fact, no phase of a mental health service which could not with benefit be incorporated into the existing organisation of the public health service. The expert on mental diseases should be on exactly the same footing and as much an integral part of the public health service as the expert for tuberculosis, orthopædics, or ear, nose and throat.

The health visitor was maternity and child welfare nurse, school nurse, tuberculosis nurse, mental deficiency visitor, blind persons' visitor, and now infant life protection visitor. She was essentially a highly trained woman, her duties carried her into almost every household within her area, and she was almost universally welcomed as an advisor and a director as to where expert advice could be obtained. Mental deficiency carried with it a stigma, and a special visitor from a department dealing with mental health would often be resented. Earl Russell had urged in the House of Lords that early mental treatment should at all costs be kept away from the machinery of insanity. Obviously the best person to use as the first line of ascertainment in mental health was the general health visitor.

Unity of Command Essential for Efficiency.

The report of the Mental Deficiency Committee strongly urged close coöperation between the mental treatment service, the poor-law and lunacy administration, the public assistance committee, and the education authority. Coöperation was all very well in theory, but if the best practical results were to be obtained unity of command was essential. The Board of Control and the Royal Medico-Psychological Association were opposed to making medical officers of mental services part of the staff of the public health service, but their objections were not very convincing. The suggestion that such officers would not be of senior standing was without foundation. The heads of departments in Derbyshire were entirely independent clinically, and Dr. Ash was merely their administrative chief. It had been said that the administrative officer was not a mental expert, but nor was the mental expert an administrative expert. The administrative officer did not claim to be an expert in the various departments which he administered at present. The mental expert would soon find that detachment of his service would not make him independent but would bring him into subservience to a layman, probably a lawyer, as had happened under the Education Act of 1921 and the recent draft order under the Local Government Act, 1929, whereby school medical officers were placed under directors of education and poor-law medical officers were to have been made subservient to the public assistance officer. In conclusion, Dr. Ash deprecated the tendency to specialisation.

Dr. REGINALD WORTH outlined the provisions of the Local Government Act and the Mental Treatment Bill. He supposed that a general health committee for the treatment of physical and mental illness would be one of the most important branches of the public assistance committee in each county, and that mental health would require a special subcommittee to provide for the treatment of all mental disorder. Here at last was an opportunity for the treatment of the mentally sick and defective to rejoin the stream of general medicine. The centralisation of mental hygiene under one authority in a local government area was a sound policy, but its success would depend upon the administrative machinery adopted. The Royal Medico-Psychological Association had always urged that the mental hospital and mental deficiency services should not be dissociated.

The Mental Treatment Bill.

The passing of the Mental Treatment Bill was a great event; while preserving ample safeguards against wrongful interference with liberty it provided facilities that could not fail to result in widely extended early treatment which would ultimately prove preventive. The opportunity which Clause 5 afforded for early treatment was of the highest value, but the requirements introduced during the committee stage were seriously disappointing. The committee had left very little difference between "recommendation" and "certification," a most important distinction if "back-parlour" treatment was to be avoided. All that should be asked of the recommending practitioners was a declaration that the person was incapable of volition and likely to benefit by temporary treatment. Safety lay in notification and visitation, and not in any enlargement of the terms of recommendation. Altogether too much stress had been laid in the debates upon the inspection of institutions. Visitation involved much more than inspection. No doubt the effect of conversations between commissioners on the one hand, and patients, superintendents, or medical officers on the other, depended largely on the personality of the commissioner; nevertheless, his status was not unimportant, and it would be a great

pity if commissioners who were not members of the Board ceased to hold His Majesty's commission. An error which had been made in the discussions was the assumption that there would be a large reduction in the number of certified cases under care. The provision of temporary treatment was not going to reduce the number of persons ultimately requiring certification by more than 15 per cent.

Dr. W. A. POTTS agreed that mental disease and mental deficiency must be a branch of public health, but that did not mean that the two forms of mental disorder could be treated in the same institution. He could not agree that mental disease could often be attributed to a single cause. There was nearly always some psychological factor in addition to many physical factors. He thought that all child guidance clinics should ultimately be linked up with the school medical service, but in some cases it might be advisable to have an independent clinic in the first instance. If the work were to be part of the school medical service it must be carried out on a very comprehensive scale, and there were at present very few workers competent to undertake child guidance. He cordially agreed with Dr. Ash about the dangers of specialisation; nobody could deal with mental disease unless he had had a thorough all-round training, for every kind of treatment might be wanted on occasion. The narrow specialist was, as a rule, quite ineffective.

Dr. Potts described the evolution of the Hallam Hospital at West Bromwich from an ordinary poor-law hospital with one non-resident medical officer and less than 20 trained nurses, as it had been five years ago. Now it had four resident doctors and seven visiting specialists, an up-to-date theatre, a bacteriological laboratory, one of the best X ray rooms in the country, and every kind of equipment. In the old days patients entering the observation wards had almost all been certified or drafted into the house as senile dements. Last year—excluding mental defectives and senile cases over 70 years of age—49 per cent. of those admitted had been discharged improved and only 7 per cent. certified. Mental disease and mental deficiency were absolutely distinct. Mental defect was an inborn condition characterised by abnormality of the brain cells and cure was impossible; the essential treatment was training. Every case of mental disease, on the contrary, should be looked upon as curable if taken early enough. The two conditions required different types of medical officer. Medical students received an absolutely inadequate training in mental disease and none at all in mental deficiency. He had asked a number of young practitioners what they knew about mental defect; while most of them had heard of it, none of them had ever seen a case or knew anything whatever about it. To this, of course, school medical officers were an exception. Yet mental defect was on the increase and its incidence was greater than that of mental disease. It was sure to increase as long as birth control was taught to the healthy and not to the defective, the alcoholic, and the improvident.

Since the passing of the amending Act it was no longer necessary to prove the existence of mental defect from birth. It had therefore become possible to certify cases of epilepsy and encephalitis lethargica which had developed during adolescence. The serious danger thus arose of a tendency to wait until these cases became certifiable instead of treating them. There was a widespread opinion that encephalitis lethargica was not amenable to treatment because serious lesions had been found in the brain in fatal cases. It by no means followed that all cases had these lesions, and in fact encephalitis lethargica, if taken early enough, could be cured by energetic treatment. Dr. T. C. Graves had even succeeded in curing cases of five years' standing.

After a brief discussion, in which Dr. C. T. MAITLAND, Dr. T. W. HILL, and Dr. BINNIE DUNLOP took part, Dr. ASH replied

EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting of this Society held on March 12th, with Dr. H. S. DAVIDSON, the President, in the chair, Dr. LEITH MURRAY (Liverpool) read a paper on

MYOMECTOMY: A RECORD OF 154 CONSECUTIVE CASES.

Myomectomy, said Dr. Murray, was not yet generally done as frequently as it should be. Conservation in gynæcology, although it could be overdone, was an excellent feature of our modern work. Women were marrying at a later age than formerly, and their uteri therefore were more likely to contain fibroids. He proposed to demonstrate statistically that: (1) numerous fibroids (the largest number he had removed was 41) could be taken from the substance of the uterus as safely as the uterus itself could be removed; and (2) after-results as regards comfort, menstrual function, and safe fertility were almost always satisfactory. Married women in the late thirties or early forties should not, he said, be submitted to hysterectomy merely because they had been sterile for years. He did not think it right to interfere in any radical way with the natural probabilities of married life even in women with several children provided that the fibroids necessitating interference could be removed with moderate ease. To broaden his survey he had included 60 cases in the non-pregnant woman,[1] of most of whom later information was available. In any statistical survey cases of myomectomy in the non-pregnant should, he said, be separated from those carried out during pregnancy. The two operations were different in character and conduct; in the former an attempt was made to remove every fibroid. Of 137 cases of fibroids operated on in the non-pregnant state fibroids of appreciable size were in each instance "dug out" of the musculature of the uterus; all intraligamentary fibroids were excluded. Neither degeneration (of any degree), nor infection (a very rare complication), was any real barrier to operation. In the operation itself he laid special stress on hæmostasis. Mechanical or elastic clamps were unnecessary and there was no need to reduce the resulting uterine mass by trimming or excision; involution occurred just as well and as quickly without. Examination at the end of three months showed that the uterus was normal in size and shape whatever its outline was at the end of operation. He recommended exploration of the uterine cavity in all cases where hæmorrhage was a symptom.

Dealing with a series of 137 cases of myomectomy in the non-pregnant, for three and a half years, ending December, 1929, he had, said Dr. Murray, carried out 1 myomectomy to 2·8 hysterectomies for fibroids; for the preceding two and a half years the relationship had been 1 to 3·7. Only one case had ended fatally by embolism (0·73 per cent.), whereas his mortality for hysterectomy for fibroids was 1·5 per cent. Two cases of recurrence had been observed and in one of these the uterine cavity, which four years later contained a fibroid polyp, had been explored at the original operation. Of the first series of 60 cases, 35 women under the age of 42 had had a reasonable chance of pregnancy, and of these 34·3 per cent. had had one or more pregnancies since the operation. The latter series of 77 cases had already produced, in 49 possible cases, 22·4 per cent. of pregnancies. For the total of 137 cases up to the end of 1929 the proportion of pregnancies was over 27 per cent. Many cases of acute necrobiotic degeneration could, he thought, be tided over the danger period by repeated doses of morphia.

Of ten cases operated on during pregnancy, six went to full term or viability, three miscarried within 24 hours—probably inevitably—and one died as the result of an injudicious operation carried out on a diabetic. Five cases associated with a diagnosis of intra-uterine death (three, strangely enough, proving to be hydatid moles) all did well, and two of

[1] Jour. Obst. and Gyn., 1926, xxxiii., No. 2.

them had a further pregnancy. Of two cases at full term with irreducible obstruction, one case was easily delivered, by Cæsarean section, of a living child, and four fibroids, the largest a red intramural fibroid the size of a fist, was removed. The other died of a low-grade peritonitis, six days after a Cæsarean section with an extensive myomectomy; the latter did not appear to have contributed to the fatal result.

Dr. Murray concluded by reaffirming his opinion, expressed in 1925, that myomectomy was an operation of less difficulty and danger than was supposed, was available in a large percentage of cases of women of child-bearing age, and should in such circumstances be preferred to hysterectomy.

DIAGNOSIS OF PREGNANCY.

Dr. EDWIN ROBERTSON read a paper based on the work of the pregnancy diagnosis station at the University Department of Animal Genetics. The Aschheim-Zondek test is simple, involving only injection of mice with urine, and later a naked-eye examination for the presence of blood-filled follicles in the ovaries—the *Blut-punkt* of Aschheim and Zondek. Microscopic examination of the ovaries shows that the action of the pregnancy urine is one of maturation. The comparatively massive dosage used in the test probably deranges the maturation processes involved, thus producing the atypical hæmorrhages seen in the follicles. The ovary-stimulating factors in the pregnancy urine are similar to the ovary-stimulating factors which can be extracted from the placenta, not only in the type of reaction produced in the ovary—i.e., maturation—but also in being destroyed, precipitated, and dissolved by the same agents. Therefore the active substances in the urine are probably only products of the placenta excreted for some reason as yet undefined. Hence a positive test is a placental sign and means, at least, the presence of placental elements. Now the function of the ovary depends upon extra-ovarian factors which are for the most part situated in the anterior lobe of the pituitary, and it has been shown that the ovary-stimulating powers of the placenta are similar to those of the anterior lobe of the pituitary. Wiesner has explained this mutual relationship in a most convincing way. "The internal secretion of the ovary is necessary for the inception and maintenance of the conditions of pregnancy, and the stimulus of the placental hormones is required for the continuation of the ovarian function beyond the initial phase which occurs under pituitary influence." This particular rôle of the pituitary and the activity of the placenta are reflected in the urine of pregnancy; urine which will produce ovarian maturation is therefore probably from a pregnancy.

Of the total 907 tests hitherto made, 479 have been controlled and found correct. Of these, 288 were positive and 179 were negative. Thirteen additional cases were labelled incorrect, but four of these were so designated through a misinterpretation of the test result by the clinician. Nine incorrect results out of 479 tests gives a 98 per cent. degree of accuracy. The test is also useful in detecting the presence of active placental elements and also hydatidiform mole and chorion epithelioma. Incomplete abortions, ectopic pregnancies, missed abortions, and cases of retained placenta have all conformed to the rule that if the elements present are alive and active then a positive result will be obtained and vice versa. It is thought that both hydatidiform mole and chorion epithelioma are extremely active in the production of the ovary-stimulating substances and that the presence of lutein cysts in association with these conditions is strong evidence in favour of this view.

Lysozyme.—Dr. D. Nabarro writes that in his remarks made at the meeting of the Medical Society for the Study of Venereal Diseases (THE LANCET, April 5th, p. 753) it was not Mr. Percy Flemming to whom he referred as having discovered and named the material now known as lysozyme, but Mr. Alexander Fleming of St. Mary's Hospital. It was Prof. Rominger, of the Children's Hospital at Kiel, who was quoted as favouring injections of sterilised milk.

Reviews and Notices of Books.

SURGICAL DIAGNOSIS.

By American Authors. Edited by EVARTS AMBROSE GRAHAM, A.B., M.D. Bixby Professor of Surgery, School of Medicine, Washington University, St. Louis. London: W. B. Saunders Company, Ltd. 1930. In three volumes. £7 10s. per set. Vol. I. Pp. 919. Vol. II. Pp. 871.

THIS work, of which two volumes have been issued, promises to be a credit to American surgery. Though the title of "Surgical Diagnosis" might have excused a somewhat narrow outlook, the editor has wisely interpreted his task in a broad sense. The articles in the first two volumes deal with ætiology, pathology, and to some extent with treatment in so far as they illuminate diagnosis, and while due stress is laid on the clinical aspects, laboratory methods are not neglected. The list of distinguished surgeons who contribute to the work prepares the reader for a surgical feast, and his expectations are realised. The first volume is devoted to the consideration of wounds, infections, post-operative complications, diseases and injuries of the vessels, bones, muscles, fasciæ, and tendons, including fractures and dislocations, and so is in considerable part orthopædic in character. The two major sections are by Dr. Leroy Charles Abbott and by Dr. John Albert Key. Both are excellent; that by Dr. Abbott provides a résumé of orthopædic surgery which could hardly be bettered, either in clarity of exposition or inclusiveness. The section on fractures, while admirably serving its purpose, suffers from the necessary omission of those questions of treatment which constitute the more fascinating aspects of this branch of surgery. The article on diagnosis of joint disease and injury by Dr. Nathaniel Allison deals with a very difficult subject clearly and concisely, while the name of Dr. Kanavel as joint author of the section on infections of the hand is sufficient guarantee of its quality. The illustrations throughout this volume are excellent, with the possible exception of some of the X rays of abnormal conditions of the spine; some skilful retouching of the negatives would have improved the teaching value of these.

The second volume opens with a chapter on gynæcological diagnosis, and this is followed by sections on the skin, face, neck, and thyroid, the alimentary canal from stomach to colon, with sections on the spleen, on hernia, and on acute abdominal emergencies. The chapter on gynæcology suffers from compression. The diagram of air distension of the tubes produced as Fig. 576 is hardly worth a further reproduction as Fig. 589. No reference in the text is made to the illustration of radium therapy (Fig. 540), and it is hardly good enough to justify its inclusion. On the other hand, a few more illustrations would have been helpful in the section on the face and jaws, particularly in regard to diseases of the tongue. The same criticism applies to the chapter on diseases of the neck which is entirely unillustrated. The alimentary canal receives clear and careful treatment, but it seems unfortunate that the sections on liver, gall-bladder, and pancreas, which presumably are relegated to Vol. III., could not have been discussed with the remainder of the digestive tract.

While congratulating Dr. Graham on the way he has carried out his editorial duties, we would make two suggestions. The first is that his own bracketed comments or interpolations, valuable as they are, would be better incorporated in the article by agreement with his contributor. The second is that the bibliographies at the end of each section should be rearranged on a uniform plan, to include the quoted authorities in the text, the unnumbered lists of papers and the references in foot-notes.

These volumes are in themselves a fine achievement, and will make all those who come across them eager to possess the completed work.

DISEASES OF THE EYE.

Sixth edition. By Sir JOHN HERBERT PARSONS, C.B.E., D.Sc., F.R.C.S., F.R.S., Ophthalmic Surgeon, University College Hospital; Surgeon, Royal London (Moorfields) Ophthalmic Hospital. London: J. and A. Churchill. 1930. With 21 plates and 348 text-figures. Pp. 678. 18*s*.

THIS text-book from the pen of an acknowledged authority can be safely recommended to students and practitioners. Though recent advances are incorporated the author limits his book to practically its former size. The slit lamp, although it has produced no revolution in ophthalmology, has already proved itself of service in practical diagnosis, and a new diagram shows how the minute structure of the lens can be illuminated by this lamp. Another diagram shows how a foreign body in the cornea can be exactly located with its help. The importance of the presence of solid particles in the aqueous which could not be detected without the slit lamp is also stressed. Other useful additions are diagrams explaining "Rönne's step" in the perimetric diagnosis of glaucoma, a figure showing senile marginal atrophy of the cornea, and several figures taken from drawings or photographs of the late Mr. Coats (for years pathologist to Moorfields) illustrating retinal vascular degenerations and the atrophic nerve in tabetic optic atrophy. The account of the treatment of wounds of the cornea and sclera is somewhat fuller than before.

PRACTICAL PSYCHOLOGY AND PSYCHIATRY.

Sixth edition. By C. B. BURR, M.D., late Medical Director, Oak Grove Hospital, Flint, Mich. Philadelphia: F. A. Davis Company. 1930. Pp. 378. $2.75.

THIS small book is evidently written by an experienced psychiatrist, whose psychology is of a practical sort. The opening chapter, which is mainly a free paraphrase of Bertrand Russell, will not appeal to the English reader, but after skipping this he will find the rest well arranged, adequate while avoiding unnecessary elaboration, and full of sound practical advice. The psychology is that of the old "faculty" brand, but is clearly put and well related to the disorders of the faculties occurring in mental disease. The chapter on aberrations in the sphere of sex is curious in its selection of material and fails to mention masturbation at all. In that on definition and causes of insanity the author leans to the physiogenic and ignores the psychogenic side; he includes vicious habits as causing 25 per cent. of cases, whereas most people would regard these as results of the disorder of mind. The descriptions of syndromes are excellent; occasional trifles may arouse critical comment—e.g., the suggestion that dementia præcox may be caused by typhoid, and reference to the "syphilitic bacillus"; nor would most people regard adolescence as the period from 25–35 years of age. The assertion that "paranoia and pellagrous insanity" are mental defects from congenital causes or arrest of development in infancy must surely be an error of proof-reading, some transposition of matter having doubtless occurred. The chapter on management of insanity from a medical standpoint is sound, practical, and reliable; that from the nursing standpoint excellent as to general principles; while the final sections on mental hygiene, though brief, emphasise all essential points.

The author prefaces the book on the title page as being "for use in training schools for attendants and nurses and in medical classes, and as a ready reference for the practitioner." In this country we should consider it too theoretical to be more than an interesting addendum to a handbook for training nurses; the medical student will find it valuable illumination for his course in psychological medicine; but it is the general practitioner and the newly joined junior medical officer in a mental hospital who will appreciate it to the full. To complete the information required by these readers a chapter on legal matters and procedure for certification or other conditions required by American law in the management and care of mental patients might be added.

NOTABLE BRITISH TRIALS.

The Trial of Browne and Kennedy. Edited by W. TEIGNMOUTH SHORE. London: W. Hodge and Co. 1930. Pp. 218. 10*s*. 6*d*.

Browne and Kennedy were hanged two years ago for the murder of Police Constable Gutteridge. The chief legal interest lay in the question whether the two should be tried jointly or separately. This is a question for the discretion of the judge at trial; if he exercises his discretion judicially and no injustice results, no other court will interfere. As usual the Court of Criminal Appeal had no ground for criticising the handling of the case by so experienced a judge as Mr. Justice Avory. Kennedy had incriminated Browne in a remarkably full statement to the police. Joint trial could be said to have embarrassed the defence. When this point was taken on appeal against their conviction, the Lord Chief Justice ridiculed the doctrine that, if two persons of bad character commit a crime together, they must never be tried jointly because the character of one may hurt the other. The trial is devoid of medical interest save for the fact that the murder was committed while the criminals were in possession of a motor-car stolen from a doctor's garage. The car had contained certain medical appliances, subsequently discovered in Browne's premises; his explanation of how he came by them was unconvincing. The murderers carelessly left a spent cartridge case in the car when they abandoned it a few hours after the theft. The gunsmith's evidence identified the pistol which had fired the shot. Apart from this important advance in detective science, the trial was scarcely more notable than any other trial for murder.

Browne and Kennedy carried firearms, intending to use them to avoid capture. They shot the constable dead while doing his duty; further shots were callously fired into his eyes. Had these outlaws not been brought to justice there would have been great public uneasiness. Could a referendum have been taken on the question whether their punishment should be death or a long term of imprisonment, it might have revealed strong support for the retention of capital punishment.

BLOOD GROUPING IN RELATION TO CLINICAL MEDICINE.

By LAURENCE H. SNYDER, Sc.D., Associate Professor of Zoology, North Carolina State College, Raleigh, N.C. London: Baillière, Tindall and Cox. 1929. Pp. 153. 22*s*. 6*d*.

THIS book represents the only attempt in the English language to envisage the present state of knowledge in regard to the bloo groups. It contains little that is entirely new, but is of value in that it brings together for the first time in English a large number of facts until now only available in scattered articles in various journals, many of them in foreign languages. Nothing appears to have escaped the author and the bibliography is monumental. In common with most recent workers on the subject he regards it as practically established that the whole constitution of the blood groups can be explained by the postulation of the original agglutinogens A and B of von Dungern and Hirschfeld; the description of the various agglutinogens which filled the literature on the subject a year or so back he regards as having had their roots in errors of technique. He regards the view of Bernstein on the inheritance of the groups (based on the conception of the triple allelomorphism of the dominants A and B and the recessive O) as adequate to meet all the

requirements of the situation as at present known. All the author's own observations on the subject, and they are numerous, are in conformance with this hypothesis. Chapters IX., X., and XI., dealing with the inheritance of the groups, are particularly valuable.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXIII. No. 2. Pp. 233–495. April, 1930.—The number is dedicated to Prof. W. H. Welch, an honorary member of the Pathological Society of Great Britain and Ireland, on the occasion of his eightieth birthday on April 8th, 1930.—Primary Malignant Intrathoracic Tumours, by J. Maxwell (London). Of 239 tumours at St. Bartholomew's Hospital, 184 were primary bronchial carcinomata; it is suggested that the oval-celled carcinoma arises from the basal layers of the mucosa. Some of the mediastinal tumours are sarcomata arising in lymphatic glands.—An Embryonic Tumour of the Liver containing Striated Muscle, by H. L. Sheehan (Manchester). In a girl of six the liver contained a number of papilliferous cysts, one of which became malignant.—An Unusual Case of Diffuse Tuberculous Infiltration of the Myocardium, by J. G. Thomson (Aberdeen).—Antivaccinal Serum: Evidence for Slow Union with Virus in vitro, by C. H. Andrewes (London). In the body the antibody of antivaccinal serum is effective almost at once in preventing the effect of virus; in vitro the virus is neutralised only after several days.—Specific Antibody Absorption by the Viruses of Vaccinia and Herpes, by W. Smith (London). The viruses absorb their corresponding antibodies.—Multiple Malignant Neoplasms, by J. W. Orr (London). In 7207 autopsies, 1046 of which showed malignant disease, there were eight in which two independent malignant tumours were present. There is no evidence that one tumour has any influence on the development of another.—Fatal Granulomatosis of the Central Nervous System due to a Yeast (Torula), by F. B. Smith (Harrogate) and J. S. Crawford (Ilkley). A woman of 31 with generalised blastomycosis, the lesions apart from the nervous system being inconspicuous.—Invasion of Epidermis by Carcinoma, by J. S. Dunn (Manchester). A mucinous carcinoma at the anus growing into the epidermis and resembling Paget's disease of the nipple.—Tissue Culture in the Study of Immunity to Herpes, by C. H. Andrewes (London). Herpes virus multiplies and forms inclusive bodies in tissue cultures of rabbit testis and may be carried on through serial cultures. It grows equally well in tissue cultures made from the testes of immunised rabbits. Immune serum prevents infection of the cells but has no influence after infection has occurred.—The Inheritance of the Blood Group Factors, by G. K. Kirwan-Taylor (London). The examination of 250 fathers, mothers, and babies supports Bernstein's theory that there are three allelomorphs, A, B, and O.—Two Cases of Fœtal Rickets, by J. Preston Maxwell (Peking). Two clear cases in children born from mothers with severe and untreated osteomalacia. H. M. Turnbull (London) reports that the bones of one of the cases show the changes of rickets combined with those of Barlow's disease.—The Rôle of the Spleen in the Production of Antibodies, by W. W. C. Topley (London). Experiments suggesting that the spleen is concerned in the elaboration of antibody or of some precursor.—The Toxicity of Irradiated Ergosterol, by J. B. Duguid, M. M. Duggan, and J. Gough (Cardiff). Large doses do not produce loss of weight, arterial calcification, &c., if the rats are fed on an ordinary mixed diet; positive results are obtained with a synthetic diet rich in calcium.—Epithelial Proliferation in the Lung of the Rabbit brought about by Intrapleural Injection of Solutions of Electrolytes, by J. S. Young (Leeds). The reaction to salts is determined almost exclusively by the cation. Trivalent metals are more effective than divalent and these than monovalent. Among the heavy metals capacity of cause cell growth is inversely proportional to solution pressure.—Spinal Metastases in a Case of Cerebral Glioma of the Type known as Astrocytoma Fibrillare, by D. S. Russell and H. Cairns (London). Pin-head metastases in the subarachnoid space.—The Genus *Willia*, by J. F. D. Shrewsbury (Birmingham). A systematic account of three species of this genus of yeasts.—A Transplantable Melanoma of the Mouse, by H. E. Harding (London), and R. D. Passey (Leeds). Arose in skin of ear. A large proportion of the cells in the tumour are extraneous phagocytes stuffed with melanin.—Intravitam and Supravital Staining: the Cellular Reactions following Mild Irritation of the Peritoneum, by D. F. Cappell (Glasgow). Consult the original for details.—Acute Disseminated Encephalomyelitis as a Sequel to "Influenza," by J. G. Greenfield (London). Two cases following vague febrile attacks, one fatal in five days, the other in seven weeks. The perivascular demyelination and other lesions are of the same type as those found in the encephalitis which sometimes follows small-pox vaccination or measles. This "post-vaccinal encephalitis" is a disease per se.—Experimental Vaccinal Encephalitis in the Monkey and the Rabbit with Special Reference to the Problem of Encephalitis following Vaccination in Man, by E. W. Hurst and R. W. Fairbrother (London). The essential lesion of experimental infection of the brain with vaccinia virus is a fibrinous hæmorrhagic and polymorphonuclear meningitis, completely different from post-vaccinal encephalitis.—The Reaction of the Central Nervous System to Vaccinia Virus by J. McIntosh and R. W. Scarff (London). The lesions produced in the brains of rabbits by virulent strains of vaccinia virus are essentially the same as those found in post-vaccinal encephalitis in man.—A Primary Carcinoma of the Kidney, by I. Gray (Aberdeen). Diffusely infiltrating the organ.—A Specimen of Implantation of Secondary Carcinoma within the Intestines, by J. H. Teacher (Glasgow). About a hundred small tumours of spheroidal-celled carcinoma in the loose areolar tissue of the submucosa of the small intestine, probably from a carcinoma of gall-bladder.—The Gonococcal Complement-fixation Test: Improvements in Technique, by I. N. O. Price (London). Gonococci dissolved in alkali and precipitated by alcohol yield a good preparation by which the time taken by the test can be materially reduced.

Reports and Analytical Records.

CHELTOVA TONIC FOOD BEVERAGE.

(CHELTINE FOODS CO., CHELTENHAM.)

THIS food, which is of a light chocolate colour, is prepared for use by mixing two spoonfuls to a breakfast cup with hot milk and sweetening according to taste. It is intended for occasional or regular use, and it may be regarded as an appropriately balanced food material. It claims to be rich in vitamins A, B, and D, and to contain C. On analysis the following results were obtained:—

	Per cent.
Carbohydrates	59·51
Fat	12·47
Protein	17·50
Mineral matter	5·06
Moisture	5·46

The carbohydrates are derived, inter alia, from germinated grain and from cocoa; there is no evidence that starch other than that natural to the cocoa is present. The mineral matter contains 0·41 per cent. of phosphorus (P_2O_5) and 0·4 per cent. of iron in a soluble state. Lecithin and an active diastase are also present.

THE LANCET.

LONDON: SATURDAY, APRIL 19, 1930.

POST-GRADUATE MEDICAL EDUCATION.

LAST week there was published by the Ministry of Health a document of the highest significance in the cause of medical education, and one, moreover, which indicates that a course advocated, and often vehemently demanded, for the past 20 years, is now to be taken. A central scheme of post-graduate education in London has passed from the stage of hope to that of accomplishment, and when the movement took place it took place quickly. A committee appointed in the year 1925 by Mr. NEVILLE CHAMBERLAIN, then Minister of Health, to draw up a practical scheme of post-graduate m[illegible]l education centred in London," have made their Rep[illegible] and the recommendations are both unanimous and eminently workable. We summarise this Report briefly elsewhere, and it should be noted that immediately upon its appearance an announcement was made on the part of the Ministry of Health accepting the findings of the committee. For Mr. GREENWOOD said that the Government, in agreement with the views of the committee, would grant £250,000 for building and equipping a medical school as an integral part of a post-graduate centre in London, to be placed at the Hammersmith Hospital, Wormwood Scrubs. This hospital of 400 beds became the property of the London County Council at the beginning of this month, under the terms of the Local Government Act; the Council's coöperation in the development of the scheme may be relied upon, as may that of the University of London.

The necessity of providing post-graduate medical education in London has been insisted upon for years wherever and whenever medical education has been under discussion, but active work to secure that end, though for long in motion, has had little material result, however fair the early promises. Hence to many who have had the cause of medical education at heart it may seem almost incredible that a plan has arrived, ready for working, under which obstacles, hitherto fatal to anything like a general scheme of London post-graduate teaching, have suddenly faded away. The early work of JONATHAN HUTCHINSON and the Medical Graduates' Clinic, the later activities of the Fellowship of Medicine, subsequently amalgamated with the Post-Graduate Medical Association, have all appeared fruitless because, for this sound reason or that, a centre at which was provided even the minimum of what was necessary could not be established. But these pioneer efforts have had their part in bringing about the position which has now been reached, and this should be a source of gratification to many who hitherto have experienced only disappointment in their various efforts. The initial step forward was taken when Dr. CHRISTOPHER ADDISON, the first Minister of Health, set up the Post-Graduate Medical Committee, which sat under Lord Athlone, and issued a report some nine years ago. This was a strong committee, and its appointment was an official recognition of the fact, over and over again insisted upon by those in whose hands the conduct of medical practice lay, that the sound medical curriculum which we possess—this no one denying—needs in these days post-graduate additions, revisions, and refurbishings, if it is to play its due part in the maintenance of national health. It had been seen that in the conduct of medical practice post-graduate education will soon become an integral part, as was indicated by the growing habit of taking study leave; and while post-graduate classes became recognised as a necessity for officers in the Services, those familiar with the working of medical practices at home knew that the family practitioner needed opportunities for supplementing his scientific equipment every bit as much as his colleagues directly in the service of the State. The findings of the Athlone Committee were in no sense a revelation, when the committee put on record the outstanding needs, first, for the establishment in London of a central school of hygiene, and, secondly, for a post-graduate hospital with a medical school attached. Such were the conclusions of those who had taken part already in long discussions on various aspects of the question, and who gave evidence, many of them, before the Athlone Committee. But, alas, the conclusions of these debates always appeared to demand the unattainable; and now, suddenly, both needs have been met. For since the issue [illegible] the Athlone report the London School of Hygiene and Tropical Medicine has been established, while more recent legislation has made possible the acquisition of a general hospital to be applied with an attached school, to post-graduate needs. During the long years of discussion it came to be generally admitted that no progress in a post-graduate scheme of medical education for London would ever be made until a hospital with a sufficient number of beds could be obtained to which a medical school could be attached, where training could be given fitted to the needs of the graduate, since graduate and undergraduate medical teaching cannot be made to run hand in hand at the same institution. The hospital has been found, and so have the means for its proper development and adaptation.

Thus far very good, but much cause for thought remains; there is need for definition of the scope of the work ahead if just judgments are to be formed of the policy that may ensue in respect of many things. For example, the selection of the officiate is going to exercise many minds. Post-graduate education is a term that covers much, especially when the efforts represent what a Nation with wide possessions feels moved to do in its Metropolis. Post-graduate education is needed as much by the family practitioner as by the officer in the Services, and as much by those at home as those abroad; while, with every desire that London should take a rightful place as an international centre of medicine, we must not wish to depend either on the goodwill or on the fees of strangers for the success of a new London post-graduate school. Hence it is a varied clientèle whom the school should serve, and serve equally well, and proportionately to the different demands on its activities and resources. Instruction, therefore, of very different sorts may be needed, and a personnel of very different sorts may be looked for in the teaching staff. A salary that could reasonably be offered to a good teacher along certain lines of post-graduate training could not be offered to another and more widely known man, and though the latter would be the teacher whom some of the adherents to the school would expect to hear, he might none the less be but ill-fitted for an educational appointment. Perhaps a rota of teachers of the needed learning and variety might be obtained from the undergraduate teaching centres; the obstacles here are obvious, but need they be unsurmountable?

This is but an example of the matters which remain to be dealt with. They are details, and only details by comparison with the arrival of a great central scheme, but there will be room in their adjustment for the display of adequate leadership, and it is not too soon to give them consideration.

PULMONARY ASBESTOSIS.

THE introduction of that extremely useful substance asbestos into industry has unfortunately given rise to a new occupational risk and to yet another form of chronic pulmonary fibrosis. The material has in one form or another been known since the days of Greek and Roman civilisation—the ancient writers refer to it as "unquenchable stone"—and CHARLEMAGNE is said to have had a table-cloth made of it, which was cleansed by throwing it in the fire. In earlier days the hornblende variety of asbestos was often referred to as amianthus. Sir THOMAS BROWNE, the author of Religio Medici, in one of his poems sighs that he might have amiantine toes which would not suffer from the gout. The indestructibility of asbestos has no doubt been the primary reason for its introduction into trade processes; asbestos will resist great heat, strong acids, and alkalis, whilst owing to its fibrous structure certain varieties of it can be carded and spun like a textile. A report[1] just published by the Home Office deals with the effects of asbestos dust on the lungs and on the dust suppression in the asbestos industry, and is written by Dr. E. R. A. MEREWETHER and Mr. C. W. PRICE, respectively medical and engineering inspector of factories. Dr. MEREWETHER'S report is based upon data obtained in an extensive investigation made during 1928 and 1929, initiated by the Home Office, following the discovery of non-tuberculous fibrosis in the lungs of an asbestos worker, of sufficient severity to necessitate treatment in hospital. Prior to this the Home Office had knowledge of only two deaths in which the inhalation of asbestos dust was a contributory cause; a survey of the industry in 1910–11 had not revealed any serious hazard. The well-known triad—exposure to dust, fibrosis of the lungs, and high mortality-rate from pulmonary tuberculosis—has long been recognised in industrial processes involving the use of free crystalline silica, but, as Dr. MEREWETHER remarks, the fact that a serious, even fatal, degree of fibrosis can be produced by other dusts has not been generally appreciated. A peculiar feature of the fibrosis produced by asbestos dust is the occurrence in the sputum or lung-juice of bodies, described by Prof. MATTHEW STEWART, which have a curious resemblance to a minute crustacean.[2] These consist, as BURTON WOOD and GLOYNE have shown, of a series of discs around a central spicule of asbestos.

The manufacturing processes fall into one of two groups according as they employ (more or less) pure asbestos and asbestos along with other dusty substances. The former group has been the subject of this inquiry on the ground that the effect of asbestos dust alone must be worked out before the complicated factors can be assessed. The population at risk in this group of the industry is not exactly known, but is estimated at 2200. A certain amount of selection was used in the examination, new-comers and long-time workers being chosen. The men examined were with one exception at work on the day of examination; their number (excluding 11 cases who had previously worked in other dusty occupations) was 363, or 16·5 per cent., of the estimated total workers in the industry. Of these, 95 (or 26·2 per cent.) showed a diffuse fibrosis of the lungs attributable to the inhalation of dust; 21 others had precursive signs of the disease. In 133 cases radiograms were made; 62 of these showed definite diffuse fibrosis, 25 were only suggestive. Dr. MEREWETHER is careful to emphasise the fact that only a proportion of the workers have been examined and that it would be unfair to assume that roughly 1 in 4 asbestos workers have fibrosis; the group examined was loaded with a high proportion of men who had been five years or more in the industry. The actual figures were these. There were no cases of fibrosis among those who had been employed less than 4 years, 36 cases in those employed from 5–9 years, 27 cases in those employed 10–14 years, 15 cases in those employed 15–19 years, and 17 cases in those employed over 20 years. Considering the relation of fibrosis to age the largest number of cases were found in the age-groups 30–39 and 40–49; Dr. MEREWETHER deduces that the important factor is the length of exposure, and that the age factor is negligible. The difficulties in ascertaining the incidence of fibrosis amongst workers in particular processes seem insurmountable as many processes are housed in one room and workers are transferred from one process to another. But there is clearly a lower incidence and probably a later onset among the spinners as a group than among those who crush, card, or weave asbestos. No evidence was found to indicate that one variety of asbestos is more potent than another in producing fibrosis. Concentration of dust and length of exposure are interdependent factors. For a number of years disablement, it seems, is curiously slight, even more so than in the case of silicosis. This may be due in part to the character of the disease, and in part to the fact that the work is not as a rule strenuous. The affected worker often continues at work with occasional breakdowns from bronchitis until he his aware of shortness of breath upon exertion. A terminal broncho-pneumonia or other acute infection may supervene while the man is still at work; with others there may be a period of invalidism. Particulars are given of ten cases up to the end of 1929 in which an advanced degree of abestosis without tuberculosis was the primary cause of death, nine being verified post mortem. The length of exposure in these cases varied from 9 to 24 years. The rate of progress seems to vary within wide limits. With continued exposure to high concentrations of dust the fibrosis may be fully developed in from seven to nine years; with a lesser the fibrosis may take 15 to 25 years to mature. So far as the available data go there is no special liability to pulmonary tuberculosis amongst asbestos workers.

Preventive measures are dealt with by Mr. C. W. PRICE in the second part of the report. The factories and workshops concerned number at least 160, of which 18 are textile factories. Small premises are the rule. The majority are well-housed and well-ventilated, but there are some open-sided sheds which are difficult to keep clean, and some which are congested with material. The arrangements for ventilation vary much. Dust removal systems where used effect a measure of general ventilation; over-head extracting fans are unsuitable and little used. Extraction by downward displacement has been considered for weaving rooms and Mr. PRICE considers it might, with suitable safeguards, replace the localised exhaust ventilation, although it could not be successful without efficient heating. While very dusty processes are already recognised, he points out

[1] H.M. Stationery Office. Pp. 34. 1*s.* 3*d.*
[2] THE LANCET, March 1st, p. 445, and March 29th, p. 701.

that in processes such as spinning and weaving, in which in other textile trades special methods for dust control are not required, precautions must also be taken in asbestos works. The manufacturers are clearly confronted with the necessity of attaining conditions which will ensure much less dust in the atmosphere than can be tolerated safely in comparable trades not using asbestos. The recommendations in the report include the application of efficient localised exhaust ventilation at dust-producing points; the substitution of enclosed mechanical methods for hand conveyance, and for dusty handwork generally; the effective enclosure of dust-producing machines and plant; and the substitution of wet methods for dry. Young persons should be excluded entirely from specially dusty work.

STATE MEDICAL SERVICE.

THE objects of the State Medical Service Association have been revived in the National Medical Service Association, the constitution of which was adopted last week at a meeting held at the House of Commons by invitation of three medical Members—namely, Mr. SOMERVILLE HASTINGS, Dr. ALFRED SALTER, and Dr. ETHEL BENTHAM. Membership of the new Association is to be open to all registered medical men and women and dentists, to registered medical and dental students, and to others who are in sympathy with its objects. The primary aim is to advocate and make clear to the medical profession and to the public the advantages of a national medical service, and for this purpose it will hold public meetings, publish and circulate literature, and otherwise promulgate its cause. The Association will also take steps to promote and secure legislation giving effect to its objects. In a footnote to the constitution it is stated that a national medical service should include the establishment of a medical service available to all members of the community and providing every necessary form of medical, surgical, obstetrical, dental, and preventive treatment, coördinated as one service under the Ministry of Health. It will be recalled that these were substantially the aims of the State Medical Service Association founded in 1912 with the late Prof. BENJAMIN MOORE, F.R.S., as president, Dr. JANE WALKER as hon. treasurer, and Mr. CHARLES A. PARKER as hon. secretary, the activities of which were overshadowed by the coming of the war. This Association was founded because its promoters felt that the time had come for freeing a large section of medical men and women from the distasteful and incongruous task of assessing and collecting fees for services rendered; in its stead they should be guaranteed an adequate and certain salary during their active years of service, coupled with a system of gradual promotion and followed by a generous pension. Under such a scheme the present hospital system would be placed, it was urged, on a firm financial basis, hospital staffs being properly remunerated and hospital doors opened to all sections of the community. The scheme was frankly described as the organisation of the medical profession as a branch of the nation's civil service. The new Association has, we understand, as yet gone little beyond the drafting of its constitution and acceptance of the principle that an efficient medical service can only be built up if the doctors who are serving in it are allowed a large say in the conditions of service. Its promoters feel that the time has come for the State to accept responsibility not only for certain special affections such as tuberculosis and venereal disease, but for the provision of efficient treatment for all who require it. There is, however, nothing of the reforming bigot about them, and there is no suggestion of placing all doctors under Government control while improving, from the public point of view, the medical activities of the State.

Annotations.

"Ne quid nimis."

PATENTS FOR FINE CHEMICALS.

IN summarising the report of the British Science Guild on the British patents system, we commented on it from the point of view of the medical inventor.[1] In a recent address to the Society of Chemical Industry[2] Mr. F. L. Pyman speaks from the point of view of the manufacturer. He points out that chemical firms incur enormous expenditure when they undertake the research which leads to the preparation of new or improved substances. It is not unreasonable for them to expect a temporary monopoly of the drugs which are discovered through their enterprise. In the absence of a monopoly they have little incentive to market the product. Dakin's solution, for instance, is a valuable antiseptic which is little advertised simply because it was not patented and can be manufactured by anybody. Supposing that a manufacturer prepares all the many possible derivatives of a certain drug which has purgative properties, and eventually finds one which is an efficient purge and is at the same time free from objectionable actions. If he puts this substance on the market under a registered name—the "something brand" of the drug—other manufacturers will speedily market it as the "something else brand." If he sells it disguised as a constituent of an undeclared mixture the medical profession will be prejudiced against it. The only other course open to him is to keep his knowledge to himself and try to find some allied substance with a similar action "new" enough to be patented. Obviously, Mr. Pyman concludes, an adequate system of monopoly patents is essential to the manufacturer as an incentive to research, to the marketing of products, and to the disclosure of processes.

Mr. Pyman welcomes the proposals of the British Science Guild as a means of protecting "biological" products without infringing the ethical code of the medical profession, but is not at all so sure of their value for "chemical" drugs. "Dedicated" patents might well protect such inventions as "quinanil" and thyroxin, but a patent is in effect a reward for disclosure, and the manufacturer cannot be expected to disclaim the reward in the way that the medical research worker is expected to do. If the manufacturer cannot patent the fruits of his enterprise in endowing research he will try to keep his processes secret. Mr. Pyman instances the case of histamine, the activity of which was demonstrated in 1910. Soon afterwards Mr. Pyman devised a new and improved synthesis which was patented by Mr. Wellcome and himself. If the employing firm had been able to obtain only a patent which they could not control they would have had no inducement to allow Mr. Pyman to publish his method, and he feels that the result of substituting "dedicated" for monopoly patents will be to restrain the patenting of improved processes for the manufacture of known compounds, and consequently to hinder the publication of scientific work. Moreover, as he points out, chemical inventions often proceed step by step, and the manufacturer who cannot obtain a monopoly for his drug will endeavour to protect some intermediate product essential for its synthesis. He advises all interested parties to scrutinise very carefully the proposed changes in the patent system before they are allowed to pass into law.

[1] THE LANCET, March 29th, 1930, pp. 698, 718.
[2] Jour. Soc. Chem. Industry, March 21st, 1930, p. 151.

OPHTHALMOLOGY IN EGYPT.

THE third annual report of the Giza Memorial Ophthalmic Laboratory, recently published, contains, in addition to a summary of the work for the year 1928, a brief account of the laboratory itself. It was founded as a memorial to the men of the Egyptian Labour Corps and Camel Transport Corps who gave their lives while serving with the armies of the British Empire during the Great War. The funds for its erection were voted in 1921 by the Imperial War Graves Commission in London, and with the approval of the Egyptian authorities, the scheme of Mr. A. F. MacCallan, at that time Director of the Ophthalmic Section of the Department of Public Health, was adopted, for the erection of a laboratory for pathological study and research in connexion with diseases of the eye. The Egyptian Government having granted a further sum for equipment, the laboratory was opened in 1925 on part of the site given by the Egyptian Government for a new Ophthalmic Hospital at Giza, which was itself opened in 1926, since when the two institutions have worked side by side, it being arranged that the Director of the Laboratory should be a European ophthalmic surgeon who should also be an honorary surgeon in the adjoining ophthalmic hospital, and that he should be assisted by a European pathologist and two Egyptian doctors specially trained in ophthalmology. The report, written by the Director, Mr. Rowland P. Wilson, of the work done in 1928 includes accounts of clinical and pathological cases of interest, and is well illustrated. Much attention is devoted to trachoma which affects as many as 90 per cent. of the Egyptian population, but no new light is thrown on its pathogenesis. The results of different methods of treatment, both of trachoma and of acute purulent ophthalmia, are compared; injections of milk appeared materially to shorten the duration of the acute stage. Both in this publication and in the *Bulletin* of the Ophthalmological Society of Egypt for 1929 the value of subconjunctival injections of phenolaine in the treatment of corneal nebulæ is spoken of, a method first employed in India by V. Nesfield. A number of cases of proptosis from tumour and other causes are also described in the *Bulletin*, which affords evidence of sound ophthalmological work.

A SANATORIUM PHYSICIAN ON THE STETHOSCOPE.

IN his report for 1929 Dr. J. Gravesen,[1] medical superintendent of Vejlefjord Sanatorium in Denmark—that institution in which so much pioneer work has been done since its foundation by Prof. Saugman 30 years ago—takes stock of the present state of the tuberculosis problem as far as the early diagnosis and most effective treatment of pulmonary tuberculosis are concerned. It really is amazing what a change has come over this scene during the last few years, and Dr. Rip-van-Winkle after sleeping for a decade or so would now wake up to quite a new world. It is not new only in that ephemeral world of treatment, in the durability of which none of us trusts, but also in the field of pathological anatomy in which some of us have been tempted to find truths and facts more lasting than brass. Only a decade or two ago the first deposits of tubercle in the lung were to be found in the apex, above the clavicle. Now they have shifted further down; and it is in the early infiltration demonstrable by the X rays, below the clavicle, that the radiologically-minded, radiographically-trained, pathological anatomist now seeks the beginning of things tuberculous in the lungs. The practitioner may ask: "What concern is it of mine, this new vogue?" The answer to this question by sanatorium specialists like Dr. Gravesen is more or less as follows: Thanks to the understanding and perfecting of serial skiagrams of the lungs, it is now possible, if a specialist in this field is employed, to detect the signs of incipient pulmonary tuberculosis much earlier than was the case only a few years ago. Phenomena which less than ten years ago were regarded as early signs of tuberculosis are now considered as late signs thereof. The first onset of the disease, the stage in which there is an early extension of the infection in a limited area of the lung (the early subclavicular infiltration) is often, probably in most cases, mistaken for a "cold," influenza, or the like. After invaluable time has been lost, and the early and most curable stage of the disease has been irrevocably passed, the patient is put on the waiting list of a sanatorium, whose medical superintendent ultimately examines him and finds advanced disease in a case "sent for diagnosis, query early tuberculosis." Dr. Gravesen writes:—

> "In the face of this tragic situation, we may derive help from recent gains in our knowledge which emphasise unequivocally the fact that the earliest beginnings of pulmonary tuberculosis are associated with insignificant and often quite negative stethoscopic signs . . . the stethoscopic examination, even when it is carried out with all the finesse which, in the course of time has been devised for its rescue, is an exceedingly imperfect device which must of necessity be supplemented by serial skiagrams, supported by fluoroscopy, if it is to be a guide to the detailed diagnosis."

Be it noted that this is not the opinion of a specialist who has studied no other special branch of medicine than radiology, and who despises other means of diagnosis, such as auscultation and percussion, largely because he has not practised and mastered them. It is the opinion of a sanatorium physician who, though specialising in radiology, has perforce had to familiarise himself with every known test of tuberculosis. Dr. Gravesen does not hesitate to describe the outcome of recent advances in our knowledge of the genesis of pulmonary tuberculosis as "a new era," with preventive and therapeutic possibilities transcending anything hitherto achieved in this field. Though the stethoscope will assuredly be used as long as man survives as a more or less intelligent being on the earth, it would seem that the time is passing when, in the hands of a distinguished and emphatic specialist, it proves, in the span of ten minutes or so, to be the sole arbiter of our fate.

[1] Meddelelser fra Vejlefjord Sanatorium, 1930, pp. 28.

SENSATION OF HEAT AND COLD.

THE study of the skin as a sense-organ has attracted less attention than the study of the other organs of special sense, and physiologists are not yet agreed on the nature and exact situation of the end-organs responding to thermal stimulation. Heat-therapy in its various forms is so frequently employed as an adjunct to treatment that any advance in the knowledge of the anatomical and physiological basis on which it must ultimately rest is welcome. In the current number of the *Journal of Physiology* is a report by H. C. Bazett, B. McGlone, and R. J. Brocklehurst on an investigation, carried out in the department of physiology at the University of Pennsylvania, on the temperatures in the tissues which accompany temperature sensations. By inserting thermo-couples into the skin at various depths, in the neighbourhood of warm and cold spots, the temperature changes were indicated by galvanometer deflection and recorded simultaneously with signalled temperature sensations. Small metal applicators, heated or cooled by circulating water, were placed over the selected areas of skin. Surface measurements showed that the temperature of the applicator was never reached by the skin, but was only slowly approximated. The rate of penetration of the thermal change was found to be 0·5 to 1·0 mm. per second, and was slowed by vascular dilatation. Warmth was found to be conducted more rapidly than cold. The latency of sensation was measured and correlated with the rate of penetration, allowance being made for the time taken in nervous processes. The estimated depth of the organs concerned was found to be 0·6 to 0·2 mm. for the end-organ for

warmth, and 0·15 to 0·1 mm. for that for cold, in the skin of the forearm. If the very superficial position of these structures should be confirmed by other investigators, it is interesting to note that they are in a zone to which actinic rays can penetrate, a fact which may point to a possible explanation for the physiological interaction of heat and short-wave stimulation of the skin. The rapid falling-off of the temperature changes in the deeper tissues is demonstrated very conclusively by the photographic records of the actual temperatures at the various depths. The fact that paradoxical results, indicating temperature changes opposite in sign to those anticipated, were recorded in some instances is a further proof of the difficulties encountered when attempts are made to raise the temperature of deep-lying tissues by superficial applications to the skin. Recent research work in this country has shown that when the skin is heated by radiant heat the rise of subcutaneous temperature is dependent on the wave-length employed.[1] By focusing the light of a carbon-arc lamp on the skin with a glass lens it was found possible to raise the subcutaneous temperature several degrees higher than by employing a source of dark heat. The latter produced more scorching and was not tolerated so well. The coördination of recent work on the warming of the deeper tissues of the body is important, not only from the clinical point of view, but also because it must prove a very important consideration in our estimation of the value of any method of heating our houses and possibly of cooking our food. As far as clinical methods are concerned the most efficient way of raising the temperature of the deep tissues, of a whole limb or of an organ, and so far the only reliable and accurate method, is the passage through these tissues of the diathermy current. The temperature can then be raised at will to the optimum desired and by passing the current in the direction of the longitudinal axis of the limb the whole column of blood is warmed. But when the diathermy current is applied with a view of raising the temperature of the body as a whole, it is frustrated by the compensatory heat-regulating mechanism of the body and the normal body temperature is regained shortly after the onset of treatment.

STOCK VACCINE IN BRONCHO-PNEUMONIA.

THERE are well-known difficulties in estimating the value of any particular line of treatment in such a disease as pneumonia, but it might be thought that any really efficacious method would reveal itself in reducing the mortality of broncho-pneumonia in young children. There is, however, wide disagreement as to the value of vaccines in this disorder. An interesting study has recently appeared in a special number of the *Journal de Médecine de Lyon*[2] devoted to diseases of children where Dr. Ch. Gardère and Dr. J. Savoye deal with their experiences in 72 unquestioned cases of broncho-pneumonia in children between birth and two years of age. The cases were rigorously selected in the sense that only those patients with the classical symptoms and signs were admitted to the series, and every effort was made to exclude cases of bronchitis or other mild complaint, only too often included in statistics of broncho-pneumonia. Lobar pneumonia was eliminated as far as possible by radiological examination; tuberculous broncho-pneumonia was excluded by post-mortem findings or the presence of a positive tuberculin reaction; throat swabs were taken whenever the appearance of the fauces was suspicious; and finally all cases admitted in the last stages of the disease—i.e., dying within 24 hours—were omitted from the series, as were examples of terminal broncho-pneumonia in marasmic infants. Of the 72 cases that remained 34 were treated systematically with a stock vaccine in daily and increasing doses until the temperature came down to normal, while at the same time the classical measures for treating pneumonia were adopted. Among these the mortality was 58 per cent. The remaining 38 cases were treated with various other remedies such as anti-pneumococcal serum, protein shock (injections of milk), and autogenous vaccines. Among these the mortality was 75 per cent., showing a difference of 17 per cent. in favour of stock vaccine. The authors, however, are careful to point out that three or four deaths more or less in either of the groups would have completely altered the final result. But while the value of their vaccines remain uncertain there are several points of interest in their analysis of the results. For example, the greatest apparent benefit from the vaccine was found in the age-group 6–12 months, while it failed completely, as indeed did any form of treatment, to help the secondary forms of broncho-pneumonia following whooping-cough, measles, and chicken-pox. Autogenous vaccines prepared from organisms present in the nasopharynx during an attack proved less efficacious than stock vaccine containing the organisms habitually met with in broncho-pneumonic lesions. Antipneumococcal serum was not only disappointing but actually harmful. The care paid by Dr. Gardère and Dr. Savoye to the accuracy of their diagnosis and their appreciation of the difficulties of assessing the results are to be set against the smallness of the series. The evidence they adduce in favour of stock vaccine justifies a more extended trial under similar rigorous conditions.

NOISE IN HOSPITALS.

HOSPITAL patients often have to put up with a perpetual disturbance by small noises, and Dr. Harvey Agnew[1] points out that this nuisance is largely due to the echo and amplification of sounds right through the building. This is, he says, partly a result of modern fireproof construction with tile or concrete on a rigid framework of steel. In residential houses the reverberation which characterises an empty room or building is overcome by furnishing and by various surfacing materials which absorb the sound and so prevent it from being thrown from wall to wall. The coefficient of absorption of various substances has been established on the basis of comparison with an open window, the absorptive value of which is taken as one. Carpets have a coefficient effect of 0·15 to 0·3, and heavy rugs from 0·3 upwards. Tiles made of fibre, felt, or mineral products may have a coefficient of 0·45 to 0·74, but linoleum or varnished wood only of 0·03, concrete of 0·015, and terrazzo or marble 0·01. Ordinary smooth plaster ceilings are said to reflect a higher percentage of sound waves than a mirror does of light waves. The long, open tunnel corridor and lift shaft transmit sounds from end to end of the hospital. Much noise can be eliminated by breaking the corridor at frequent intervals with self-closing doors and enclosing the lift shaft and stair wells. Cross-beams across a corridor ceiling help to break sound waves, and ward doors set back from the corridor line stop conduction along the walls. Although terrazzo is a clean and durable flooring it is noisier than linoleum or rubber, and amplifies the sound of footsteps while linoleum deadens them. Better than ordinary concrete are cinder concrete or "aerocrete;" the latter is made with a specially prepared cement which breaks up the admixed water into gases and makes the concrete spongy and light. Few modern buildings show any serious attempt to make the walls soundproof. A good filler for this purpose is powdered gypsum, which is also strongly fire-resisting. Dr. Agnew quotes Prof. Sabine as saying that a 2-inch air space has as much insulating power as a 6¾-inch solid brick wall, provided the space is not bridged by anything rigid; but even a single nail driven right through will cause vibration on the inner surface.

[1] Hill, L.: Journal of Actinotherapy, March, 1929.
[2] Feb. 20th, p. 125.

[1] Canadian Med. Assoc. Jour., March, 1930, p. 414.

In a new building sound transmission along the ceiling can be reduced by suspending the ceiling from special hangers broken by felt pads. Old ceilings can be coated with a sound-absorbing material, such as an acoustical plaster made of pumice particles bound with cement or gypsum. The entry of street noises into wards can be reduced by reflectors outside the windows and baffle boards faced with sound-absorbing material fastened vertically 4 inches inside the window. Much annoyance may be caused to patients by loud buzzers or bells on the telephone system, the clicking of noisy locks, and the noises of plumbing. Knobs and clicking latches can be replaced by hooks, and doors can be provided with checks and springs. A new plumbing silencer has recently been perfected.

That elaborate precautions for the supression of noise are no unnecessary fad has been shown, it is stated, by Laird's experiments at the Colgate Psychological Laboratory. He found that a passing truck, without wakening a sleeper, may so disturb him that his systolic blood pressure rises 20 mm., while increased muscular tension is recorded by a galvanometer. Obviously this response must have an exhausting effect upon the nervous system, and in a patient who is seriously ill may make possibly a difference between recovery and collapse.

THE SPREAD OF PUERPERAL SEPSIS.

THE earlier part of Dr. Macgregor's report[1] on puerperal infection in maternity hospitals describes a series of outbreaks which were all severe, rapid in spread, and extensive in incidence, considering the number of patients exposed to risk. In one group infection was introduced by the admission of a case of septic abortion; in a second group the origin of infection was uncertain, but cases recurred after the wards had been closed for some days and reopened with a new nursing staff; while in a third group the infection possibly came from a woman with persistent pyrexia ascribed to bronchitis; or, later, from a midwife with a septic finger. The report makes it clear at least that puerperal infection can spread readily under the average conditions obtaining in a nursing home, and that it tends to be persistent. On the other hand, cases of septic infection often occur in hospitals without giving rise to other cases, and this is no doubt because they are recognised early and strictly isolated before removal. No relationship was found between the presence of hæmolytic streptococci in the throats of the staff and the incidence of infections. Preventive measures, Dr. Macgregor points out, include the exclusion of parturient women who are infected, or presumably infected, from hospital wards. He quotes Dr. James Young's suggestion that cases untouched before admission should have their own institution, and that cases which have been subjected to certain kinds of interference before admission should be accommodated elsewhere. But cases where there has been manipulative interference do not necessarily become septic, and infection may occur after a single vaginal examination or after no interference at all. "It is doubtful," says Dr. Macgregor, "whether a water-tight administration based on segregation of patients in different institutions in accordance with the degree of interference before admission would be practicable or even a satisfactory method of meeting the difficulty." In the groups of cases investigated the infection appears to have spread with ease among patients whose confinements were otherwise normal, in spite of precautions and great alertness on the part of the staff. The transmission could therefore scarcely have been due to a temporary or accidental defect of technique. It is more likely, he thinks, that infection was propagated by hands, instruments, or dressings, than by infection of the staff and their conversion into carriers of the organism. But it is reasonable to assume that infection may occur from a lesion on a nurse's finger or an organism carried in her throat. Apparently the passage of infection among parturient women is insufficiently hindered by the technique in vogue, and it must be decided whether the conduct of labour in institutions is susceptible of improvement to a point at which the danger is, at any rate, reduced to a minimum. The report suggests that the evolution of a "faultless technique" demands further attention.

[1] Puerperal Infection in Maternity Hospitals: A Report to the Department of Health for Scotland. By A. S. M. Macgregor, M.D., Medical Officer of Health for Glasgow. H.M. Stationery Office. 1930. Pp. 20. 9*d*.

LIMITATION OF NARCOTIC DRUGS.

THE report which the Advisory Committee on Traffic in Opium and Other Dangerous Drugs has recently submitted to the Council of the League of Nations shows that an important stage has been reached in its deliberations. The Committee has devised a plan for estimating the world's legitimate requirements of narcotic drugs, and a workmanlike scheme for approximating world production to these requirements and apportioning the amounts to be manufactured and supplied by the various producing countries. It is proposed that each country should furnish annually to a central authority an estimate of its requirements for medical and scientific purposes of the drugs in question, production to be limited to the total amount of these estimates. The calculations would be based on the actual legitimate consumption at the present time, but each country is to be allowed to budget for a margin of supplies to cover possible fluctuations, provided that the amount is stated separately. In addition, facilities are to be given for establishing reserve stocks, but it is proposed to endow the central authority with power to intervene in the event of estimates appearing to be excessive. A pooling arrangement is to be made by manufacturing countries to each of which will be apportioned the amount it will be eligible to contribute to the pool. If the scheme can be put into operation and worked successfully, the problem of controlling the narcotic drug traffic will be solved at its very source, and the domestic supervision of the traffic by each nationality will be greatly facilitated.

INCIDENCE OF TUBERCULOSIS AMONGST HOSPITAL NURSES.

IN the March number of the *Canadian Medical Association Journal* Dr. E. L. Ross gives an account of 60 nurses who were admitted to the Manitoba Sanatorium suffering from tuberculosis. These nurses were in course of training or had finished their course at 20 different hospitals, but 54 of them came from institutions in Manitoba, so that the investigation applies almost entirely to this province. Of the 60 nurses who developed clinical tuberculosis, 50 of them broke down during their period of three years training or within one year of finishing it. Fifteen of them were below the age of 20 when this happened and 34 not yet 22. In a previous series of 69 breakdowns it was found that 81 per cent. of the nurses had begun their training before or at the age of 22. The figures suggest that the younger nurses are more likely to break down and that infection is apt to occur during or shortly after training in hospital. The incidence of tuberculosis amongst these nurses was about 6 per cent., a figure far above that for other women of their age-group; this agrees with the observations[1] made by Dr. J. Heimbeck in Oslo, where tuberculosis was much more rife amongst nurses than the general population. He found that it developed far more commonly in nurses who had a negative than in those who had a positive Pirquet reaction at the outset of their training. Of Dr. Ross's 60 cases, 34 had an acute onset which suggests a recent infection; in 19 of them the lesions were hilar or basal, and most of them did well with pneumothorax treatment. In this country, also,

[1] Arch. Int. Med., 1928, xli., 336.

it is familiar experience that acute tuberculosis developing in a young adult frequently affects the middle and lower portion of the lungs and, though apt to spread rapidly and end fatally, is none the less amenable to rest, and especially to pneumothorax treatment, in the early stages. The type and course of the disease do not seem to differ from that which occurs in other women of that age-period, but it seems unquestionable that nurses are especially liable to contract tuberculosis. We should be glad to know whether Dr. Heimbeck's observation that the tuberculin test is so frequently negative in those subsequently affected is true for other communities.

THE ŒSTRUS-PRODUCING HORMONE.

A GREAT deal of work on the ovarian hormones is being done both here and abroad, and in some ways their nature and significance has lately become much clearer. The problem is difficult because their recognition in fluids and organs depends on biological tests, which makes it impossible to be sure that all the œstrus-producing extracts prepared from many tissues, including those of the male, are identical in constitution. In such circumstances the isolation of the active substance in a pure form, especially when crystalline, is of considerable importance. Even so, the elucidation of its chemical constitution may be difficult, and its artificial preparation still more difficult. The first report of the preparation of the hormone in crystalline form was made by E. A. Doisy at the Thirteenth International Physiological Congress in August of last year. This author has not yet published his full results, but in the preliminary statement then issued he said that the amount required to restore the sexual cycle in castrated female rats was one eight-millionth of a gramme of the crystalline material. Since this announcement several other workers have obtained crystalline products of similar activity. Last December A. Butenandt, using a preparation from the urine of pregnant women, succeeded in obtaining a sufficient amount of the crystalline material, to which he gave the name "progynon," to study its chemical properties in some detail. This work has already been reviewed in these columns.[1] Details of the method of testing used have recently been published,[2] and the animal tests are described in full. Complete details of preparation have not yet appeared. The name suggested by Butenandt is open to objection, inasmuch as it was in use previously, and refers to a commercial (non-crystalline) product which was, in fact, the material furnishing the starting-point of Butenandt's research, and not its final result. Crystalline preparations have also been briefly described by Laqueur, Dingemanse, and Kober,[3] and more fully by H. Wieland, W. Straub, and Dorfmüller,[4] and by Marrian.[5] Butenandt considers that, on the basis of the animal standardisations, the products of the two former groups of workers are much cruder than his own preparation. It is well known that varying results are obtained according to the exact method used in carrying out the animal test, so that such criteria of purity need careful investigation and comparison before they can be accepted as conclusive. Butenandt, in his most recent publication mentioned above, now states that by giving a divided dose of his crystalline product spread over a period of 48 hours the activity is increased to the astonishing figure of 35 to 40 million mouse units per gramme of material.

A considerable contribution to this interesting subject is now made by Frattini and Maino in a paper on the preparation of the follicular hormone in a crystalline water-soluble form.[6] The term "follicular hormone" is used to indicate the supposed source of the hormone in the liquor folliculi of the Graafian follicles. Since this point is disputed, it seems better to use some other description, of which the terms "œstrus-producing hormone" or, as A. S. Parkes has suggested, "œstrin" appear to be the least confusing and clearly refer to the most marked action of these preparations—namely, the restoration of the œstral cycle in the ovariectomised female animal. These workers have found it possible to obtain, and in a crystalline form, an œstrus-producing hormone from the ovary and urine of pregnant women by a method for the extraction of this substance different from those employed by other workers. Further, they have been unable to obtain this crystalline body from the urine of non-pregnant women at any period of the menstrual cycle, or from the urine of males. The main features of their method are as follows:—Preliminary purification is obtained by treating concentrated urine or the filtrate obtained from macerated ovaries with neutral salts. From the precipitate the active hormone is extracted with alcohol. The impurities are removed by acids and alkalis, and by successive precipitation with salts of the heavy metals which are subsequently eliminated by sulphuration and extraction with ether. The crystals obtained after evaporation of the ether are needle-like in character, as illustrated in photomicrographs. They differ a little in size according to the source of origin. The physical and chemical properties are provisionally mentioned, but are to be described more fully in a subsequent paper. Sterols are suggested as a possible chemical constitution of the substance. Physiologically it appears to be somewhat less active than the preparations described above, the mouse unit by the divided dose method being given as one-millionth of a gramme. Whether these various crystalline substances are the same substances or whether they still consist, even after such exhaustive purification, of mixtures of the active substance with some crystalline "impurity" remains for the future to decide. At present full reports are lacking in most of the cases mentioned above, and it would be premature to compare these results until full details are available. The degree of purity already reached is such as to tax the most sensitive methods of chemical analysis and research, and this, combined with the exorbitant amount of material required as the starting-point, exerts a restraining influence on extensive chemical work on this substance. These difficulties are evidently being at present rapidly overcome, and the importance of this extremely potent preparation justifies the expenditure of so much energy and skill on the elucidation of the problem.

[1] THE LANCET, Jan. 4th, p. 42; Jan. 11th, p. 94.
[2] Butenandt, A., and Zeigner, E. von: Hoppe-Seyler's Zeit. für physiol. Chem., 1930, clxxxviii., 1.
[3] Nature, Jan. 18th.
[4] Zeit. für physiol. Chem., 1929, clxxxvi., 97.
[5] Jour. Soc. Chem. Ind., March 21st, p. 237.
[6] Frattini, B., and Maino, M. A.: Archiv. Istit. Biochim. Ital., 1930, ii., 3.

IMMUNISED SERUM IN POLIOMYELITIS.

ON various occasions we have referred to the treatment of poliomyelitis with serum administered at an early stage. The greatest difficulty in this mode of treatment is to recognise the disease early enough, but there is also another difficulty—namely, that the only efficacious serum available has been that of human beings who have suffered from poliomyelitis. Attempts to produce artificially a serum with antiviral properties have hitherto been unsuccessful, and the only animals whose blood has been shown to contain specific antibodies are monkeys which have actually had the infection. In a recent paper,[1] however, Dr. R. W. Fairbrother, who is working at the Lister Institute in London, describes the production and the testing of a serum with anti-poliomyelitic properties which has been obtained from the horse. The animal received, over a period of some two months, 15 graded injections of an emulsion prepared from the spinal cord of monkeys which had died of poliomyelitis. The strain of virus with which these monkeys had been infected was an especially powerful one, and it had been found

[1] Jour. Exper. Path., February, 1920, p. 43.

to give very consistent results. The disease which it produced had an incubation period of about five days, and death always followed three or four days after the onset of symptoms. The minimal infecting dose was found to be between 0·0005 and 0·003 c.cm. of emulsion. The injection of emulsified spinal cord material from these monkeys produced in the horse no definite sign of reaction as determined by pulse and temperature. Blood was withdrawn before beginning the inoculation and at intervals during the latter part of the series, and the serum was submitted to severe tests to determine its protective properties. The method of testing consisted in mixing small portions of serum with an amount of infective emulsion equivalent to at least 100 times the minimal infective dose, and injecting the mixture intracerebrally into monkeys. Control animals received similar injections of virus emulsion mixed with saline. It was found that the normal serum of the horse taken before inoculation had no effect on the virus, the incubation period in the monkey subsequently infected being within the usual limits. The serum taken from the horse towards the end of the course of inoculations showed definite antiviral properties and, provided the amount of serum was equal in quantity to the amount of infective emulsion employed, no poliomyelitis resulted in the monkeys from injection of the mixture. The power of the horse's serum to neutralise the virus was found to increase pari passu with the strength of the inoculation which the horse had received, the serum of the third bleeding having a distinctly stronger action than that obtained at the first bleeding. After a resting phase of two months, more blood was taken from the horse and was tested in a similar way. The results of this test were deprived of their full significance by an intestinal infection in some of the monkeys, but it appeared that during the resting phase the antibodies in the serum had decreased. An attempt was later made to assess the curative action of this serum by injecting it into monkeys at various intervals after they had been infected with the powerful strain of poliomyelitic virus which was being used. Unfortunately, however, these experiments were vitiated by the occurrence of another infection in the experimental animals. Some comparative tests have also been made with human convalescent serum, and from the results obtained it appears that the antiviral content of the serum obtained from the horse at the end of the course of inoculations was at least as great as that of the human convalescent serum. Since the diagnosis of poliomyelitis in the earliest stages is as yet impossible, the production of serum from animals may not have an immediate practical application, but if serotherapy is to be useful during epidemics it is apparent that the serum must be available in large quantities in order that it may be given even to doubtful cases and possibly to certain contacts. For this reason Dr. Fairbrother's work may well prove of great practical importance.

At its session on March 28th Dr. Arnold Netter [2] told the Société Médicale des Hôpitaux de Paris about a case which he described as "rapid cure, following injections of immunised monkey serum, of poliomyelitis in the preparalytic stage." The patient, a child of five, received, in the course of four days, 40 c.cm. of serum from an immunised hamadryad monkey and also 50 c.cm. of antipoliomyelitic horse serum. Recovery was complete.

THE ENGLISH CONJOINT QUALIFICATION: ADMISSION OF FOREIGN GRADUATES.

THE new edition of the regulations for the diplomas of L.R.C.P. and M.R.C.S. contains important alterations which will take effect after July.

Candidates for the licence are required to complete five years of professional study. Before beginning this they must pass a recognised examination in general education and also an examination in chemistry and physics equivalent to Part I. of the "pre-medical examination" in chemistry, physics, and biology. The professional examinations are two in number, and each has two sections, as follows:—

First Professional Examination.—Sect. I. Anatomy and Physiology. Sect. II. Pharmacology and Materia Medica.

Final Professional Examination.—Sect. I. Pathology. Sect. II. Medicine, Surgery, and Midwifery.

The most important alteration is in the conditions under which students and graduates from abroad are admitted to the Final Examination. The new regulations may be summarised as follows:—

1. A candidate holding a licence in *India*, whether he has completed four or five years' curriculum—is required: (*a*) to pass a recognised Preliminary Examination in General Education, in accordance with the Regulations of the Examining Board in England; (*b*) to pass the First Examination in Anatomy, Physiology, Pharmacology, and Materia Medica; (*c*) to complete two years' (24 months) Medical and Surgical Hospital Practice in a recognised Medical School and Hospital in this country after passing Sect. I. of the First Professional Examination. Admission to one subject of the Final Examination is allowed after 18 months of such Hospital Practice.

2. A candidate who has qualified in India after a full curriculum of not less than five years at certain recognised Medical Colleges is exempted from Sect. II. of the First Examination and requires only one year's Hospital Practice before admission to the Final Examination.

3. Candidates who have not obtained a licence or other qualification in India, are required to pass the Preliminary Examination and the Pre-Medical Examination, to complete the full curriculum and to pass the First and Final Examinations.

4. Candidates who have completed part of the curriculum at a recognised Medical College, but have not qualified in India, are required to pass a recognised Preliminary Examination in General Education, but are exempted from the Pre-Medical Examination, and are allowed to count such part of the curriculum thus completed in India. They must pass the First Examination and complete the full curriculum before admission to the Final Examination.

5. Candidates holding the Diploma of the National Board of Medical Examiners of the *United States of America* are admissible to the Examinations for the L.R.C.P., M.R.C.S., under the same conditions as Members of recognised Universities in the British Possessions.

6. Members of recognised *Universities outside the British Possessions* are admissible to the Examinations under the following conditions: (*a*) Graduates in Medicine and Surgery are required to pass the First Examination, and subsequently to complete 12 months' Hospital Practice at a recognised Medical School and Hospital in this country, before admission to any part of the Final Examinat on; (*b*) Undergraduates are required to complete the full curriculum of 33 months for the Final Examination at a recognised Medical School and Hospital in this country, after passing the First Examination.

Hitherto it has been possible for foreign graduates to proceed at once to the Final Examination.

Prof. J. J. R. Macleod, F.R.S., will deliver the Oliver Sharpey Lectures at the Royal College of Physicians of London on Tuesday, April 29th, and Thursday, May 1st, at 5 P.M. His subject will be Diabetes as a Physiological Problem.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The preliminary programme of the next annual congress of this institute, which will be held at Portsmouth from June 4th to 9th, has been issued. Among the discussions which will take place in the various sections is one on National Health and the Local Government Act of 1929, and one on Radium and Cancer Clinics (Section of State Medicine and Municipal Hygiene). Papers read to the Naval, Military, and Air Section will include those on Post-Encephalic Parkinsonism and Military Pensions and on the Control of Malaria at H.M. Naval Base, Singapore. The Section of Industrial Hygiene will discuss Health in Seafaring Occupations, the Health of Women and Girls in Industry, and the Health of Dockyard Workers among other subjects. The Prevention of Sickness and Death in Motherhood is the main subject for debate at the Section of Women and Children and the Public Health, while papers will be read on the cognate subjects of Post-Puerperal Disabilities in Women and the Hygiene of the Domiciliary Labour Room. In the Section of Tuberculosis the Present Position of Surgical Treatment of Pulmonary Tuberculosis will be discussed.

[2] Bull. et Mém. de la Soc. Méd. des Hôp. de Paris, April 7th, p. 537.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXVIII.

SIGNIFICANCE OF PROTOZOA, SPIROCHÆTES, AND HELMINTHS IN THE BLOOD.

PART I.*

IN no other branch of medicine does laboratory diagnosis assume more vital importance than in the diseases of tropical origin; so that in order to estimate the import of a positive blood examination, and so as not to *underestimate* the significance of a negative finding, it is essential that the practitioner should be familiar with the life story of organisms found in the blood in tropical disease. In other words, in almost all blood infections the investigator is playing a game of hide-and-seek with minute parasites which are influenced by a number of incompletely understood circumstances. Therefore, one negative result, or even a series of negative results, need not necessarily invalidate a diagnosis which is rendered probable on clinical grounds.

The Malarial Parasite.

In tropical practice malaria assumes the chief place, and at the outset it is necessary to bear in mind that this term embraces not one disease, but a group of fevers due to three distinct parasites. The life cycle of the *benign tertian* and the *quartan* in the blood stream differs very considerably from the *malignant* or *subtertian*. In the two former the process of schizogony takes place in the red blood corpuscles circulating in the peripheral blood, while in the latter the greater part of this process is evolved within the capillaries of the internal organs. It is necessary to recapitulate a few well-ascertained facts concerning these parasites and their associated diseases.

The *benign tertian* is the most widely spread form of malarial infection. The parasite is apparently common in the true tropics, subtropics, and even in temperate countries such as Russia and Holland, but appears to be absent or extremely rare in tropical and West Africa. It is the form which is most abundant in the blood stream during the febrile paroxysms and, unless it persists unchecked and the bodily resistance is low, no grave anæmia may ensue, though it may be difficult definitely to diagnose this form of malaria in the quiescent or afebrile periods. Relapses of benign tertian malaria may ensue at long intervals after the initial attack. It is comparatively common for the first relapse to take place one year after the first paroxysm; and in the interval the patient may show no outward evidence of infection at all. The parasite appears to have a life span of considerable length in the human body and to be viable (or liable to recur in appreciable and easily recognisable numbers) for three years from the initial infection. It is improbable that it can persist for a longer period, a fact which is not adequately recognised—too often this non-appreciation is the cause of errors in diagnosing (on clinical grounds) recurrent malaria in an individual who has left a malarious district for ten years or even longer. During the actual rigor the parasites can be found in the greatest numbers in the ring stage, at a later period as more mature schizonts. It is a common error to suppose that it is fruitless to examine the blood during the apyretic periods, or immediately after the defervescence of the fever. I regard it as essential that a prolonged blood examination should be done by an experienced microscopist in every case of suspected malaria, for often, in the absence of any other suggestive circumstance (such as anæmia and splenomegaly) scanty parasites in the gametocyte stage may be found, and the definite recognition of one such organism will definitely clinch the diagnosis. The benign tertian parasite is readily affected by quinine in so far as the number of circulating parasites rapidly become distorted and disappear, but the gametocyte stage is the least susceptible and often persists after quinine therapy has been instituted for some considerable time. In contradistinction to the other two forms, periodic relapses with large numbers of parasites in the blood are liable to recur in spite of prolonged and full therapeutic dosage with quinine. It can be taken as proven that in every benign tertian paroxysm parasites can be demonstrated in the blood with ease—but some weeks afterwards diagnosis by this means may be impossible, so that finer changes in the red blood cells, basophilic stippling, polychromasia, and the proportional increase of the large mononuclear cells (mononucleosis), have to be relied upon to suggest a probable diagnosis.

Quartan malaria has by no means such a wide distribution as has benign tertian. Wherever it occurs in the tropics it has a patchy local distribution and it is found sparingly in more temperate climates, such as Macedonia, Bulgaria, and Italy. It most commonly occurs in children in whom it may cause singularly little disturbance, and it may not produce any obvious outward form of disease. Apparently, this parasite is most easily tolerated by man, and, as a rule, produces less dramatic attacks of fever than does the benign tertian. The parasite may be easily recognised in its more advanced stages by its peculiar morphology. It persists in appreciable numbers in the blood during the apyrexial period and may sometimes be found when the patient is apparently in good health. Its other characteristics are its longevity in the blood stream—as far as is known this greatly exceeds the other two species—so that a single infection may persist and produce relapses for as long a period as seven years. For these reasons quartan infection in the blood can be more easily detected than in benign tertian. Its parasites are less easily destroyed by quinine than are those of the other two species, so it comes about that unaltered forms may be demonstrated in the blood stream for ten days or more, subsequent to its adminstration.

In the *malignant* or *subtertian* infection a much more complicated problem presents itself. As has been already stated, the parasite reproduces itself by sporulation in the capillaries of the internal organs, such as the spleen, liver, pancreas, heart, and brain. The blood-supply of these vital parts may be seriously interfered with or even temporarily blocked. A proper understanding of these facts will assist the practitioner in recognising the protean clinical manifestations of subtertian infections and at the same time will enable him to appreciate some of the difficulties in microscopic diagnosis. Examination of the peripheral blood in subtertian malaria is often negative. This may happen when in fact large numbers of parasites are proliferating in the internal organs of the body. The intermediary stages of schizogony do not normally occur in the peripheral blood, so that the youngest or ring form, and the fully developed crescent or gametocyte stage, are the only ones which are normally to be found circulating in the blood in subtertian infections. I am convinced that in early cases of subtertian malaria the parasite in the ring stage may be found in the blood stream without being associated with any external signs of illness. The onset of what may eventually prove to be a very serious or sometimes fatal illness is so insidious that as a matter of routine I find it advisable to examine the blood of every one returning from the West Coast of Africa, whether or no they present a history of previous febrile attacks. On the other hand, during an acute attack,

* Part II. will appear next week.

such as the well-known bilious remittent form, the parasites may exist in enormous numbers and multiple infections of red blood corpuscles may be found. The gametocyte, or crescent stage, is rarely seen in fresh infections in Europeans in the tropics. It appears usually in longstanding cases where anæmia and cachexia are very evident, or in patients who have returned to temperate climates after suffering severely from subtertian fever. In fact, the circumstances underlying the appearance of this parasite in the peripheral blood are so variable that it is difficult to describe them concisely. Subtertian malaria may provoke the most serious or even fatal symptoms, and yet the parasite may not be demonstrable in the peripheral blood. This is often true in cerebral malaria with coma, in what is known as the pre-blackwater fever state, and even in an average severe case of subtertian fever. I have seen cases with multiple rigors, bilious vomiting, and splenomegaly in whom repeated and prolonged search of the blood has failed to reveal a single parasite. In order to facilitate microscopic diagnosis in this important fever, the thick drop method is frequently employed, though with the possible exception of crescents, which may be more easily demonstrated, its utility to the clinician is questionable. There are other distinctive characters of subtertian malaria. It has the shortest life-span in the human body, and a patient leaving the endemic area need not fear relapses after a residence of nine months to a year in a temperate climate. During the whole of this period, however, the liability to the development of pernicious symptoms and to blackwater fever may persist when he is exposed to overfatigue or to cold. Subtertian infections are susceptible to the action of quinine, and the less mature stages, such as the rings, rapidly disappear from the blood stream under its influence. The crescent, or gametocyte, is least affected by therapeutic doses, but appears to be more readily destroyed by plasmoquine. When the anæmia is advanced—and it may approach the pernicious type in malaria cachexia—I have found that the ring forms and the crescents are particularly difficult to demonstrate, and it is these cases which should be regarded as most serious from the point of view of prognosis and liability to the development of blackwater fever. From the foregoing it will be understood that a diagnosis of subtertian malaria has sometimes to be made in the absence of a positive laboratory finding. Subtertian infections are more usually associated with definite splenomegaly, secondary blood changes, and a leucopenia than are the other two forms.

Double or Multiple Infections.—Malaria may complicate any other form of disease, especially enteric and dysentery infections, and it may even complicate itself. In the tropics it is comparatively common to find double infections of *benign tertian* and *subtertian* and such an occurrence necessarily influences treatment and prognosis. Serious or alarming symptoms arising in a case of supposedly simple benign tertian fever can very often be ascribed to a coexisting infection with the latter parasite, and this is usually the case in which blackwater fever supervenes consequent upon a paroxysm of benign tertian. Very rarely all three species of parasites are found in the same individual.

PHILIP MANSON-BAHR, D.S.O., M.D., F.R.C.P.,
Physician to the Hospital for Tropical Diseases, London; Consultant to the Colonial Office and Crown Agents for the Colonies.

HOSPITAL COSTS.—Last year each of the 1164 in-patients at Leeds Hospital for Women stayed an average of 13·6 days, and cost £6 17*s.* 5¾*d.*; out-patients cost about 2*s.* each. At York County Hospital (2505 in-patients), the cost was £8 9*s.* 7*d.*, a reduction of 14*s.* 10*d.*, and the average stay 24 days, a reduction of one day. On the other hand, at the Feilding Palmer Cottage Hospital, Lutterworth, (89 in-patients in 16 days), the expenditure per head, at £9 15*s.* 8*d.*, was an increase of £1 7*s.* 6*d.* on the preceding year. At Rugeley District Hospital, 185 in-patients (17·7 days' stay) cost £2 6*s.* 5*d.* per head per week.

Special Articles.

THE EFFECT OF ULTRA-VIOLET LIGHT TREATMENT ON YOUNG CHILDREN.

BY ETHEL CASSIE, M.D. EDIN., D.P.H.,
ASSISTANT MEDICAL OFFICER OF HEALTH (FOR MATERNITY AND CHILD WELFARE), BIRMINGHAM;
AND
URSULA COX, M.R.C.S. ENG., D.P.H.,
ASSISTANT MEDICAL OFFICER FOR CHILD WELFARE, BIRMINGHAM.

RECENT observations on the therapeutic use of ultra-violet light have made the doubters more doubtful, but have failed to lessen the enthusiasm of the advocates. What chiefly emerges is the insufficiency of objective data. Those actually using the ultra-violet lamps and watching the effects on their patients are almost always convinced that rapid beneficial results are obtained, but these impressions are of little value except as personal convictions. The difficulties of obtaining objective data were evident in the investigation which we are about to describe, but certain definite facts undoubtedly emerge.

We have been closely concerned in the supervision of the Birmingham Child Welfare Light Clinics, of which there are now nine in the city. These clinics treat children under five years of age, mainly for rickets and debility, and during 1928 no fewer than 1375 children attended the clinics, making 16,481 attendances. This seemed to offer a large field for investigation, but careful inspection of the records showed that only 346 were sufficiently complete for detailed study. In a large number attendance at the clinics had been interrupted by illness in the house; in others the final medical examination had been omitted because the mother failed to attend with the child. It will be understood that prolonged regular attendance is often difficult to obtain.

The procedure for admission to the light clinics is as follows. Children are recommended by the doctors at the child welfare centres and by family practitioners. They are then called to the medical examination clinic, where they receive a complete physical examination and, if considered suitable, light treatment is prescribed. In some cases other suggestions are made and no light treatment is ordered. The dose normally given is a fourth of the erythema dose (calculated on an average adult), and this is checked by giving an erythema test to each child, any undue sensitiveness indicating a reduction of the dose. Treatment is given twice weekly, and the dose is not progressively increased, since the mercury-vapour lamp is used, and there is no pigmentation. The lamps are all of the Kelvin Bottomley and Baird pattern, either 220 or 440 volts. The child attends for six, eight, or twelve treatments, and is then seen again by the medical officer.

The 346 records were selected for the following reasons:—

(*a*) Regular attendance at the clinic.
(*b*) A weight record at the beginning and end of treatment.
(*c*) No intercurrent event which made the evaluation of the result difficult—e.g., intercurrent illness, hospital treatment, country holiday.

The conditions from which the children were suffering can be classified broadly in the groups shown in Table I., and defined as given below.

1. *General Debility.*—This group comprises children of poor physique, unusually underweight and not gaining, frequently flabby and anæmic, and of subnormal vitality. The condition frequently follows an acute illness or infection. It does not include children suffering from any definite catarrhal condition; these are all included in the next group

2. *Catarrhal Cases.*—This group includes those children suffering from or excessively liable to catarrhal infections, such as rhinitis, tonsillitis, bronchitis, and otorrhœa. The majority suffer also from general debility.

3. *Rickets.*—Only those cases are included in this group where rickets is shown by X ray of the wrist bones.

4. *Malnutrition.*—This group includes those cases not suffering either from catarrhs or general debility but who, from one cause or other—e.g., inadequate diet, insufficient rest—are considerably below the normal weight and are failing to gain. Often no definite cause for the condition was assignable.

5. *Debility Due to Mismanagement.*—This group includes those children who may be summed up as "the spoilt child," and whose physical health has suffered.

6. *Amyotonia.*—This group includes children who have nothing much wrong with them but who are lethargic and flabby. Frequently they are overweight.

7. *Nervous Excitability.*—This group includes nervous children who are over active and excitable, thin, not gaining weight, and frequently suffering from sleeplessness, night terrors, and anorexia.

TABLE I.—*Classification.*

Conditions.	Age-groups.				
	(1) 12 wk. to 1 yr.	(2) 1–2 yr.	(3) 2–3 yr.	(4) 3–4 yr.	(5) 4–5 yr.
General debility ..	31	67	14	6	12
Catarrhal cases ..	22	34	19	10	8
Malnutrition ..	9	7	2	3	—
Rickets	4	20	6	1	—
Debility due to mismanagement ..	2	12	6	3	—
Amyotonia	2	10	2	—	1
Nervous excitability	3	6	3	1	1
Other conditions* ..	5	4	3	3	4
Total ..	78	160	55	27	26

Total = 346.

* Other conditions include bronchitis, asthma, and skin conditions.

It will be seen that the conditions treated were various, but the composite picture is that of a child failing to gain in weight, and a cause of anxiety to the parents from the obvious evidence of failure in normal health. These children had almost all attended child welfare centres and the usual advice about diet and hygiene had been given.

Weight.

The simplest objective data of progress lay in the observation of the weight record of the child during treatment. The cases were placed in age-groups, and the average gain in weight ascertained as compared with the average for the normal child. The result is recorded in Table II.

TABLE II.—*Effect on Weight.*

Age-group.	No.	Average period of treatment in weeks.	Average gain in weight per week in ounces.	Percentage gain as compared with normal child.	Average gain in weight of normal child per week in ounces.
1. (under 1 yr.)	78	11	4·1	113·8	3·6
2. (1–2 yrs.)	160	12	2·1	123·5	1·7
3. (2–3 „)	55	11	1·9	125·7	1·4
4. (3–4 „)	27	12½	2·2	157·1	1·4

This shows a higher average gain in each age-group than is made by the normal child, and this in a group of children who were all more or less unhealthy and had failed to gain weight for some time. Further analysis was obviously required, however, and Table III. was prepared, showing the actual numbers gaining above, below, and at the average rate in each age-group, and also showing the type of home from which the children came, in case this factor should influence the result. It will be noted that the larger proportion came from good homes. This is due to the selection of those cases making a regular attendance. The Table shows clearly that the type of home did not affect the result in any definite way. In passing, it should be noted that no free food or cod-liver oil is allowed in any of these cases by the clinics.

Table III. shows a more marked effect from light treatment on the weight of children between one and four years of age. This is possibly associated with the fact that the city child is out-of-doors less at this period than before or after—i.e., the period following the perambulator stage and preceding the independent stage. Taking all the groups, 54 per cent. of the children gained above the average, 24 per cent. below the average, and 21 per cent. at the average. None lost weight, and this the authors believe should be attributed to the cautious dosage used. Any excess of ultra-violet light appears invariably to cause a loss of weight.

TABLE III.

Age-group.	Type of home.	Gain above average.	Gain below average.	Gain at average.	Total.
I.	Good.	17	17	—	34
	Fair.	8	8	2	18
	Poor.	8	7	—	15
	V. poor.	5	6	—	11
	Total ..	38 (48%)	38 (48%)	2 (3%)	—
II.	Good.	38	6	18	62
	Fair.	13	4	16	33
	Poor.	16	4	6	26
	V. poor.	21	2	16	39
	Total ..	88 (55%)	16 (10%)	56 (35%)	—
III.	Good.	15	3	8	26
	Fair.	4	2	3	9
	Poor.	5	0	2	7
	V. poor.	8	2	3	13
	Total ..	32 (58%)	7 (13%)	16 (29%)	—
IV.	Good.	10	5	—	15
	Fair.	4	1	—	5
	Poor.	2	—	—	2
	V. poor.	4	1	—	5
	Total ..	20 (74%)	7 (26%)	—	—
V.	Good.	7	9	—	16
	Fair.	3	5	—	8
	Poor.	2	—	—	2
	V. poor.	—	—	—	—
	Total ..	12 (46%)	14 (54%)	—	—
Total		190 (54%)	82 (24%)	74 (21%)	—
Total types of home.		Good 153 (44%)	Fair 73 (21%)	Poor 52 (15%)	Very poor 68 (20%)

Classification of Types of Homes.—"Good" implies the respectable artisan or middle-class household, where diet and hygienic conditions are reasonably good. "Fair" implies the artisan home where the diet is adequate but hygienic conditions not very good, probably from causes over which the parents have no control. "Poor" implies the home where the income is inadequate and diet and hygiene both very defective. "Very poor" means the home below the poverty line where the diet is most inadequate, in quality if not in quantity, and the hygiene very bad.

General Health.

In 271 cases the records were sufficiently complete to make it possible to estimate the degree of improvement obtained in general health. In order to eliminate any criticism, the greatest care was exercised in the classification, and if any doubt existed the case was not placed in the "improved" class. The totals show surprisingly good results, considering the severity of the classification. A very high proportion (83 per cent.) improved, and no less than 37 per cent. showed marked improvement and 6 per cent. striking improvement. In each individual group there was a definite improvement in over 80 per cent. of the cases, except in the mismanaged group, where it is a question

of affecting the mother rather than the child. The catarrhal cases included some with enlarged tonsils and adenoids awaiting operation (the delay usually amounts to three months after the child is placed on the waiting-list), and the improvement in health obtained by light treatment in this period is of definite value, though it would be preferable to avoid the delay in most cases.

The malnutrition cases received a certain amount of advice in addition to light treatment but these, as well as the majority of other cases, had already been under the care of the child welfare centres for some time and were sent as failing to improve.

The rickets cases are classified not in relation to rickets, but in relation to general health. The rickets, of course, healed in every case, but in very poor homes the general health does not improve concurrently, and it will be seen that in two cases there was no improvement. The total number of rickets cases treated during the year was 293, and the small number included here is due to the incomplete records in this group. However, the results obtained are better than with cod-liver oil in home treatment; as a rule, the mothers bring their children for treatment but will not trouble to come for the final medical examination. With cod-liver oil the rapid improvement of nervous symptoms is not obtained and the mothers do not persevere with the treatment.

TABLE IV.

Condition.	Cases.	Total improving.	Improvement.	Improvement— Marked.	Striking.	None.
Gen. debility..	86	76 (88%)	29 (34%)	39 (45%)	8 (9%)	10 (12%)
Catarrhal cases	75	61 (81%)	32 (43%)	25 (33%)	4 (5%)	14 (18%)
Malnutrition ..	20	17 (85%)	10 (50%)	7 (35%)	—	3 (15%)
Rickets	32	30 (93%)	12 (37%)	14 (44%)	4 (12%)	2 (6%)
Debility due to mismanagement	24	13 (54%)	10 (42%)	3 (12%)	—	11 (46%)
Amyotonia ..	14	14 (100%)	8 (57%)	4 (29%)	2 (14%)	—
Nervous excitability	11	9 (82%)	2 (18%)	7 (64%)	—	2 (18%)
Total	262	220 (83%)	103 (39%)	99 (37%)	18 (6%)	42 (16%)

TABLE V.—*Effects on Particular Symptoms.*

Symptom.	Cases.	Total improving.	Improvement.	Improvement— Marked.	Striking.	None.
Appetite ..	120	93 (78%)	49 (41%)	38 (32%)	6 (5%)	27 (22%)
Sleep	77	59 (77%)	22 (29%)	29 (38%)	8 (10%)	18 (23%)
Nervous condition ..	76	50 (66%)	22 (29%)	20 (26%)	8 (11%)	26 (34%)
Flabby muscles	71	58 (82%)	31 (44%)	26 (37%)	1 (1%)	13 (18%)
Total	344	260	124	133	23	184

Four symptoms were studied: anorexia, sleeplessness, nervous excitability (fretfulness, bad temper), and lack of muscle tone. The result obtained was usually good, though 18 per cent. to 34 per cent. of cases in which there was failure to obtain improvement are noted. It must, however, be remembered that the mismanaged group is included, and without change of environment these are little affected.

Conclusion.

Careful observation of the effects of light treatment on city children gives definitely encouraging results. The curative effects of ultra-violet light on rickets is an established fact. Whether it is of real value in other directions remains to be proved. On young children, at the period of life where light deprivation is most common in cities, it appears to act as a definite stimulant to metabolism. The effect on nervous symptoms is particularly interesting and very well marked. Is it possible to suppose that a more effective elimination of fatigue toxins is secured?

The well-marked effect on weight is striking. The height records were not sufficiently accurate to quote, but it is probable that the increase in weight is associated with increased growth.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. R. W. Nesbitt to be Surg. Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub.-Lt. J. M. Ridyard to be Surg. Sub.-Lt.

ROYAL ARMY MEDICAL CORPS.

Capt. M. C. Paterson to be Maj. (prov.).
Capt. J. F. Wilde relinquishes his temp. commn.
Lt. F. McL. Richardson to be Capt. (prov.).

TERRITORIAL ARMY.

H. C. M. Williams to be Lt.
Capt. G. Whittaker to comd. 8th (Lond.) Hygiene Co.

ARMY DENTAL CORPS.

Capt. L. Somerville-Woodiwis to be Maj.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. G. Eager, from Active List, to be Capt.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 5TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 457 (last week 449); scarlet fever, 2426; diphtheria, 1464; enteric fever, 54; pneumonia, 1536; puerperal fever, 46; puerperal pyrexia, 102; cerebro-spinal fever, 22; acute poliomyelitis, 1; acute polio-encephalitis, 5; encephalitis lethargica, 14; dysentery, 9; ophthalmia neonatorum, 118. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on April 8th–9th was as follows:—Small-pox, 582 under treatment, 23 under observation (last week 570 and 28 respectively); scarlet fever, 2114; diphtheria, 2754; enteric fever, 21; measles, 1057; whooping-cough, 70; puerperal fever, 30 (plus 18 babies); encephalitis lethargica, 121; poliomyelitis, 2; "other diseases," 22. At St. Margaret's Hospital there were 15 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was 1 death from small-pox, 3 (0) from enteric fever, 134 (69) from measles, 9 (1) from scarlet fever, 30 (4) from whooping-cough, 51 (6) from diphtheria, 45 (15) from diarrhœa and enteritis under two years, and 61 (13) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Stepney (Met. Boro.). The deaths from enteric fever were reported from Dudley, Southport, and Hull. Fatal cases of measles were again widely distributed, with larger numbers at Manchester, 6; West Ham and Chester, each 4. Whooping-cough claimed 4 victims at Birmingham; diphtheria 9 at Liverpool. Diarrhœa accounted for 5 deaths at Birmingham and 4 at Liverpool. Birmingham and Swansea each reported 4 deaths from influenza.

The number of stillbirths notified during the week was 275 (corresponding to a rate of 41 per 1000 births), including 53 in London.

POST-GRADUATE MEDICAL EDUCATION.

THE committee appointed by the Ministry of Health in July, 1925, to draw up a practicable scheme of post-graduate medical education in London have now presented their report.[1] They begin by sketching the history of the subject and the present urgency of the problem. The lack of adequate provision for instruction in public health and for research in preventive medicine was remedied in 1922 by the establishment of the London School of Hygiene and Tropical Medicine, which was made possible by a gift from the Rockefeller Foundation. A defect that still remains is the absence of any hospital and medical school exclusively devoted to providing practical courses for doctors who wish to refresh their knowledge, learn about new developments, or participate in the clinical practice of a hospital. The committee urge the imperial, international, and national value of a British Post-graduate Medical School and its special value to the country doctor. They set themselves to establish, in the words of their terms of reference, "a practicable scheme" and have therefore not attempted to recommend anything too ideal to be translated into practical effect within a reasonable time. The scheme, they felt, must include a hospital, already large and capable of expansion, with the regular and ready provision of a substantial and increasing sum for its maintenance. It must also include the provision and maintenance of a medical school with staff, equipment, and premises at no point inferior to the best obtainable.

Schemes Considered but not Recommended.

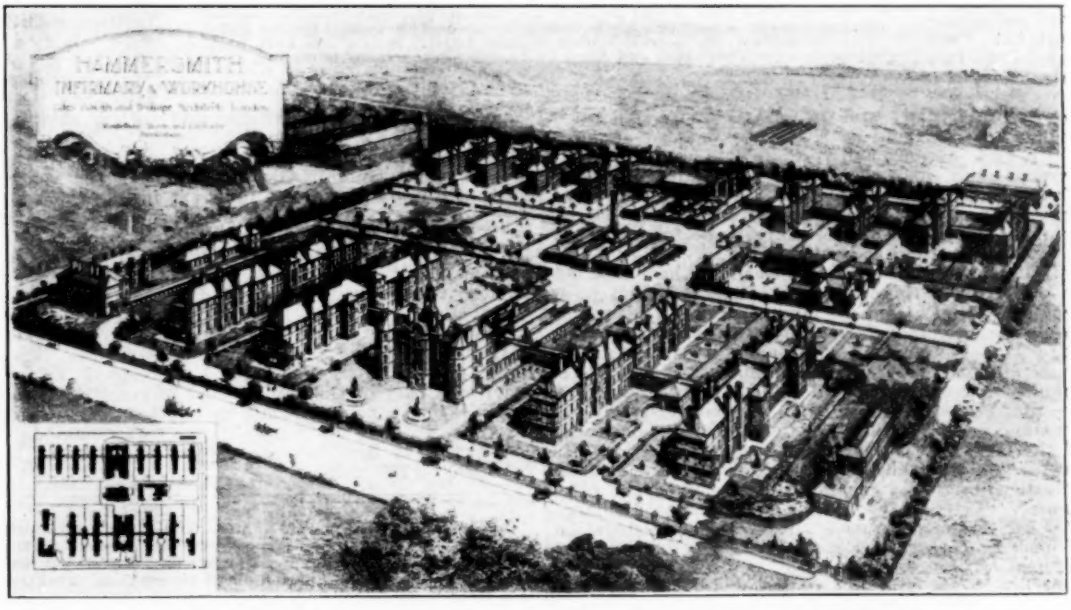
The committee considered first the building and maintenance of a new institution. This would have had the obvious advantages that site, design, and equipment could have been chosen in the light of most modern advice and that ample room could be provided for expansion. The committee soon realised, however, that this could not be called a practicable scheme, as its cost would delay its completion, at least for a considerable time. The committee felt it essential to have at least 400 beds available very soon after the inauguration of the scheme. They reckoned that the cost of the construction of the new building could not be estimated at less than £500,000, while the cost of maintenance would be not less than £100,000.

Secondly, the committee considered turning some existing hospital and medical school into the post-graduate centre. This would have preserved the traditions and reputation of an existing school, would have enlisted the help of a medical staff of high calibre and an enthusiastic group of lay supporters, would have ensured a building conveniently located and already serving a large area, and would not have involved the expenditure of large sums on bricks and mortar. The committee felt quite definitely, however, that undergraduate teaching must cease in the selected hospital and school, and they found that no suitable hospital was willing to accept this condition.

Thirdly, there was the possibility of using one of the existing voluntary hospitals without medical schools. The West London Hospital at Hammersmith was considered with especial care, as post-graduate medical education has been provided there since 1892. When the board of management of the hospital were informed that the committee desired the post-graduate institution to have 400 beds and that the board were to be held responsible for their maintenance, they viewed their financial responsibility very gravely but accepted it in principle. Detailed discussions proceeded, and it was estimated that about £350,000 would be needed to convert the hospital into a post-graduate centre and another

[1] Report of the Post-Graduate Medical Education Committee. H.M. Stationery Office. 1930. Pp. 37. 9*d*.

THE PROPOSED POST-GRADUATE MEDICAL CENTRE FOR LONDON.



A bird's-eye view of the Hammersmith Infirmary and Workhouse as it was planned in 1905 by the architects, Messrs. Giles, Gough, and Trollope (28, Craven-street, London, W.C.2), but which was not fully carried out from reasons of economy. The illustration is, however, of interest as indicating the lines on which the buildings lend themselves to completion. The actual lay-out may be seen on the map overpage reproduced from Stanford's Atlas of London. The northern block of buildings is the workhouse, now called the Hammersmith Institution, and the southern block is the infirmary, now called the Hammersmith Hospital. All the buildings were requisitioned as a hospital during the late war, and remained in use as the Special Surgical Hospital of the Ministry of Pensions from 1918 to 1924. The whole of the institution is under medical direction, Dr. J. Jenkins being superintendent of the hospital and assistant master of the institution.

£50,000 to equip the hospital and school. The cost of maintenance would probably prove to be about £100,000 per annum. The financial difficulties before the Board were therefore serious, but the scheme was apparently the only practicable one. While everybody concerned was hesitating, the committee found themselves faced early in 1929 with another possibility, involved in the proposed Local Government Act. They realised that when the Act became law nearly thirty public hospitals would be transferred to the London County Council, and the possibility of using one of these public hospitals for their post-graduate scheme could not be ignored.

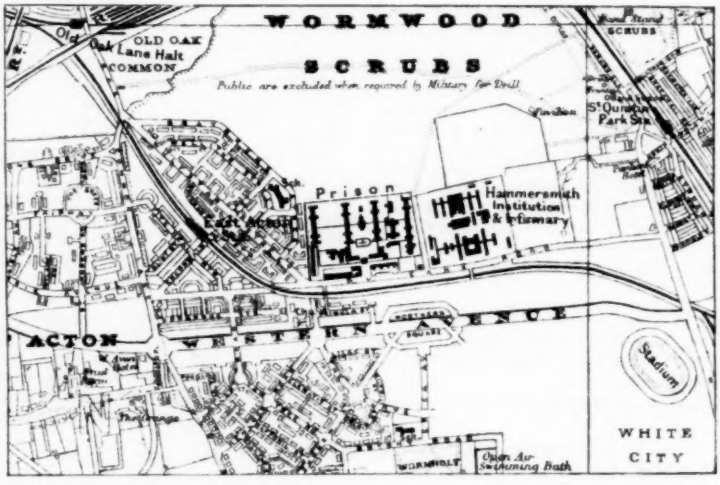
The Scheme Recommended.

After considering the public hospitals available and excluding the unsuitable ones, the committee reduced the possibilities to six and then to two, and finally selected the Hammersmith Hospital, which is situated in Ducane-road, Shepherd's Bush, on a site of 14 acres. It was built in 1905 and has 400 beds, of which 334 are at present medical and surgical, 15 gynæcological and obstetric, and 50 pædiatric. There is a resident medical superintendent and four assistant officers, with a consulting staff of six surgeons, two ophthalmologists, two physicians, two dermatologists, two bacteriologists, a dentist, and a radiographer. There is thus ready to hand a relatively modern building which is exceptionally well laid out for its purpose and has the requisite number of beds. The committee feel that this gives them an asset equivalent in value to a large part of the capital sum which would otherwise have to be found. They cannot submit an accurate estimate, but they do not think that it ought to cost more than £250,000 to convert the Hammersmith Hospital into a post-graduate institution, to equip it, and to provide residential accommodation, partly there and partly at a hostel elsewhere. The committee are unable to see any reason why the maintenance of the hospital should not remain, as it would do otherwise, a charge on the ratepayers of London. The hospital will continue to be a public hospital for the sick poor of the city, and the committee do not feel that its association with the British Post-graduate Medical School will lay any increased charge upon the ratepayers. If there should be any increased charge it will be more than made up for by the restoration of patients to earning capacity and the development of medical knowledge.

Although the committee regarded their financial problem very seriously they have by no means sacrificed the medical and administrative points of view. The Hammersmith Hospital serves a large area on the west side of London with a population which is already dense and is still increasing, and does not share with the West London Hospital the disadvantage of admitting a very high proportion of surgical casualties. The clinical material provided should therefore be just what is required. Since the London County Council has only just come into possession of the hospital it is obvious that a detailed scheme for a system of government has not yet been discussed. The committee, however, thought it better to submit their general scheme for acceptance before entering into the difficulties of administration. Another advantage of this hospital is the space around it, which leaves ample room for building a medical school and for any expansion which may be necessary. The West London Hospital has only two and a half acres of land.

The Hostel and Special Departments.

The committee think it best to build a hostel at some central spot within easy reach of the London School of Hygiene and Tropical Medicine, the other London hospitals, and the centres of recreation and social amenities. They hope to find a place which can easily be reached by road and rail from the Hammersmith Hospital. The Central London Railway, which serves Hammersmith, will be particularly convenient for students, as it also passes close to hospitals where special courses are likely to be provided and to institutions like the Royal Society of Medicine where students will look for medical literature and other aids to study.



Map showing on a scale of four inches to the mile the position of the Hammersmith Hospital and its accessibility by the Ealing extension of the Central London Railway with (at present) the nearest station of East Acton. St. Quintin Park Station connects with Kensington and Earls Court. Western-avenue is the new arterial road out of London.

Although special courses can be provided at special hospitals the committee considers that the centre itself will not be complete unless it includes departments for the study of tuberculosis, venereal disease, antenatal and postnatal conditions in women, and radiology. The Hammersmith Hospital has at present X ray and electrotherapeutic departments, a modern maternity ward with 16 beds, and an antenatal clinic. It has, however, no tuberculosis or venereal disease department and no organised out-patient department. The provision of these three departments must therefore be accepted as an inevitable part of the capital cost of converting the hospital into a post-graduate institution. There will also have to be a new nurses' home to accommodate 100 nurses at first, and capable of enlargement to take 200 or 250 nurses.

THE HOSPITAL BREAKFAST HOUR.—Warneford Hospital, Leamington, in response to the request of the majority of the staff and patients, has abandoned the new practice of washing patients and giving them breakfast at a later hour.

PRINCESS CHRISTIAN MATERNITY HOME.—Princess Helena Victoria, daughter of the founder, has opened an extension of this Windsor Home, an adjoining house having been purchased to provide additional accommodation. The King, who has hitherto made a grant of £100 a year from the State Apartments Fund, has increased the annual grant to £300.

Correspondence.

"Audi alteram partem."

PHYSICAL TREATMENT CENTRES.

To the Editor of THE LANCET.

SIR,—In his Milroy Lecture, reported in your issue of April 5th, Dr. Alison Glover alludes to the new Regent's Park Physical Treatment Centre, and also mentions the work of centres already existing in Kensington and Sheffield. He describes the Regent's Park Centre as capable of dealing with 400 patients a day. The Edgar Allen Institute, Sheffield, which covers a clinical field similar to that of the Regent's Park Centre, and which was inaugurated before the war, has for many years been called upon to treat considerably more than 400 cases daily; indeed, it has treated over 600 cases in a single day. In medical matters too much regard should not be given to arithmetical considerations; but in view of the fact that patients are only accepted at the Edgar Allen Institute on the advice of their own doctors, the figures given may be of interest as indicating the widespread demand for physical treatment.

I am, Sir, yours faithfully,

R. G. ABERCROMBIE, M.D.,
Medical Director, Edgar Allen Institute, Sheffield.

April 11th, 1930.

"THE BLOOD PICTURE AND ITS CLINICAL SIGNIFICANCE."

To the Editor of THE LANCET.

SIR,—The review of Prof. Schilling's book which appeared in your issue of April 5th (p. 754) may be not unfairly critical of the English translation or even of the original German edition. But as one who is at present working with Prof. Schilling I should like to be permitted the opportunity of mentioning a few points which may help to allow a clear conception of this work to be formed.

The method of blood examination described has been for many years and is the routine method in use here at the Charité in Berlin, in the majority of the teaching hospitals and private clinics, and in the consulting rooms of many physicians in Germany. The method is simple and briefly is as follows: Two clean slides are taken—on the one, two thick smears are made, each consisting of three to four drops of blood, on the other slide a normal thin blood smear is made. In routine practice these are taken home and allowed to dry. Then the thick-drop preparation is stained with Giemsa reagent, the film is fixed with alcohol and then stained. The thick-drop slide is examined under the microscope for eosinophil leucocyte cells, for polychromatic erythrocytes, the remnants of which are visible as delicate blue networks lying between the leucocytes. They are present almost without exception in cases of anæmia but are rarely found in normal adult blood. Net-forms, torn net-forms, and dot-like dissolution (basophilic punctation) are noted, and considered as evidence of toxicity. The coarser forms are of value in the diagnosis of lead poisoning. The stained film then is taken, examined under the low power of the microscope, and an approximate estimation of the number of erythrocytes made with special attention to their size, intensity of colour, and shape. The leucocytes in a few fields are noted and classified as to whether they appear in normal ratio to the erythrocytes, markedly decreased in number, somewhat increased or greatly increased. In practice after examining a few films, one can judge the number of leucocytes so that the estimate should not differ from that of a full leucocyte blood count by more than 2000 to 3000 per c.mm. Then under the high power a differential count of 100 leucocytes is made. Four fields are taken and 25 cells counted in each field. They are noted on a special chart under the heading of basophiles, eosinophils, neutrophils, which are divided into myelocytes, juvenile, "stab," and segmented forms, lymphocytes and monocytes. The percentage count of the various forms of cells is taken and unless special abnormalities have been found, such as marked poikilocytosis, anisocytosis, &c., denoting a severe anæmia in which a full red cell count and hæmoglobin percentage estimation is suggested, the routine examination is concluded.

The smears take but five minutes to make; the films can be stained at any later time, and then within half an hour, and the blood count takes ten minutes. This method gives the clinician a good indication of the blood picture at the time of examination and in practice is done frequently and where in the majority of cases a full blood count would not have been undertaken. It is not possible for me to discuss here the value of the blood picture, but the presence of eosinophils as seen in the thick drop or the presence of many juvenile or stab neutrophils, a shift-to-the-left (Arneth), suggesting a rapid severe regenerative process often without any evidence of a leucocytosis is of value in the diagnosis of an obscure sepsis or the course of an infective process.

In brief, Prof. Schilling has made practical a method of blood examination that can be carried out in routine practice. The blood sedimentation test is carried out as a routine by the ward clerks, as are the blood counts. It is a simple method, and is recognised as of undoubted value in the recognition of active pyogenic infection, of neoplasms, and repeated estimations are of especial prognostic value, for example, in watching the course of an individual case of pulmonary tuberculosis. The guttadiaphot is as yet in the experimental stage. Personally I am investigating certain aspects of rheumatic diseases, and I feel this method of blood examination may be of value in giving further evidence on which, at a given time, the diagnosis of activity or inactivity of an infective process may be made.

I am, Sir, yours faithfully,

FRANCIS BACH, M.D. Oxf.,
Chadwick Travelling Scholar.

The Charité, Berlin, April 7th, 1930.

CLINICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—"M.D., F.R.S. Edin." has mistaken my meaning when I said "there seem to be several equally effective methods of treating the same disease," and perhaps he will be kind enough to read the letter again. Or possibly from his own experience he can tell us whether chemotherapy, rectal permanganate, specific vaccines or, what I recently witnessed, keeping the patient drunk with brandy, is the best way of treating pneumonia. Treatment is the primary business of the general practitioner for three reasons: first, because it is the patient's one and only object for coming to see us at all; secondly, because, although we see a good many cases each day, we see each patient several times, and diagnosis is only necessary the first time; and, thirdly, because diagnosis is easy in the majority of cases, or has already been made for us by a consultant.

It is always possible to recall straightforward cases where other men have made a wrong diagnosis. I myself recently saw a man with tabes who had been treated for three years, by a colleague whom I respect, for sciatica; and there are few pleasures in life equal to that of pulling the mote out of our brother's eye. But if that colleague were to take over my practice I have little doubt he would find a beam in my own eye. The reason for such an error is inherent in human nature; my colleague knew as much or more about tabes than I do, but when he first saw the patient the disease was too slight to be recognised, and the patient usually denies infection unless he thinks the

doctor has already found it out for himself. A tentative diagnosis is made and the pains are alleviated by a simple remedy; the working hypothesis gradually becomes fixed in his mind; "trifles light as air" become "confirmations strong as proofs of Holy Writ." Nothing is so difficult as to review a case one has treated on and off for several years. But by the time the patient gets to Doctor No. 4 the diagnosis is obvious to a fourth-year student.

Nervous diseases are the happy hunting ground of the diagnostician; but they are quite exceptional in general practice, and we can easily recognise them as out of our ken (if that is the case) and send them to a consultant, who will rejoice exceedingly if he finds an "organic" disease; if it is "functional" he will treat it with contempt and leave us to treat the patient, quite oblivious of the fact that functional disease is much more serious to the sufferer than most organic diseases; true, he may not die of it, but he makes life a misery to himself and others, which is worse.

I ended my letter by suggesting that an attempt be made to discover which are the common diseases and that they be studied first.

I am, Sir, yours faithfully,

FREWEN MOOR, M.D.

Westgate-on-Sea, April 10th, 1930.

Obituary.

PEVERELL SMYTHE HICHENS, D.M. OXF., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO THE GENERAL HOSPITAL, NORTHAMPTON.

THE news of the death of Dr. Hichens, which occurred on March 28th, came as a great sorrow to his many friends. Since his retirement from practice in 1924 he had lived in Guernsey and for the last 18 months was increasingly an invalid.

Peverell Smythe Hichens was born at Speldhurst, Kent, in 1870, the second son of the Rev. Canon F. Hichens, rector of St. Stephen's, Canterbury, his elder brother Robert being the novelist. He was educated at King's School, Canterbury, Clifton College, and Magdalen College, Oxford. From there he went to St. Thomas's Hospital in 1892, and took his B.M. at Oxford in 1895. After demonstrating pathology and surgery, and holding resident appointments at his own hospital and at Brompton, he developed symptoms of lung trouble and spent a year or more at Nordrach, in the Black Forest, where Otto Walther's methods were just beginning to attract attention. In 1901 he was appointed physician to the General Hospital, Northampton, and soon acquired a good consulting practice in the town and country. In 1903 he took his D.M. at Oxford, and in 1911 was elected a Fellow of the Royal College of Physicians, having been a Member since 1899. His interest in tuberculosis was quickened by the honourable mention he obtained for his essay for the King's Sanatorium Prize in 1902, and in the following year he published an important paper on sanatorium treatment with special reference to Nordrach methods, with which a prolonged personal experience had made him familiar. At once he began to awaken local interest in the foundation of an institution for the open-air treatment of tuberculosis and his efforts were finally crowned with success when, in 1909, the county sanatorium was opened at Creaton and he was appointed its consulting physician. Of his work an old colleague at the hospital writes: "I know how sound Hichens was in his judgment of a case and how conscientious and painstaking he was in anything he undertook. I think he liked sometimes to regard himself as old-fashioned and to affect a regret that the art of medicine was becoming increasingly complicated by fresh methods and fresh discoveries. Of these, however, he was always among the first to make use." His war service was distinguished. Under the old territorial hospital scheme he was a major attached to the 1st Eastern General Hospital at Cambridge, but he quickly managed to exchange from this into a field ambulance and got to France in 1915. There he was in command, first of a casualty clearing station and subsequently of a general hospital at Calais. He was not demobilised until the summer of 1919.

DR. HICHENS.

His chief interest outside medicine was in the Church and all the time he was in Northampton he did a great deal of hard work as vicar's warden at All Saints' Church. He was a man of considerable general culture. He read constantly and knew his English literature well; he had a wide knowledge of music and was a good pianist, while every holiday produced some charming water-colour sketches. The same colleague writes: "I always think of him as rather old for his years. This may have been due to a slightly pedantic manner, but with this was combined a constant kindly courtesy which made him liked and respected by everyone with whom he came into contact."

In 1906 Dr. Hichens married Constance, daughter of Lieut.-Colonel L. Downes, and he leaves a widow, a married daughter, and a son

HERBERT JAMES ILOTT, M.D. ABERD.

Dr. H. J. Ilott, who died at Midhurst on April 3rd at the age of 77, was formerly one of the best known practitioners in Kent and came of a medical family which has been associated with Bromley for over 200 years. His ability was early shown by his achievements as a student at St. Bartholomew's Hospital, where in 1872 he was senior scholar in medicine, surgery, and midwifery, and in 1873 won the Kirke's gold medal for clinical medicine. A year later he graduated at Aberdeen with highest honours, and after a period as house surgeon at Croydon General Hospital settled down in the family practice at Bromley. Here the remainder of his professional life was spent, and it was not until a few years ago that he retired and went to live at Midhurst. He was lately elected Master of the Society of Apothecaries, but failing health prevented him from undertaking the duties.

Dr. Ilott leaves a widow, with a son and a daughter.

COVENTRY AND WARWICKSHIRE HOSPITAL.—The number of in-patients increased last year by nearly 300, and out-patients were more numerous by over 2000. In 1910 there were 1433 in-patients; last year the number was 5099. At £6 17*s.* 10*d.* last year the average cost of an in-patient was 6*s.* 3*d.* less than in 1928. The cost of each patient at the Alcock Convalescent Hospital (average stay 17·5 days) was £4 5*s.*, an average of 4*s.* 10*d.* per day.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MENTAL TREATMENT BILL.

ON April 11th the House of Commons considered the Mental Treatment Bill on report.

Power to Receive Voluntary Patients.

On Clause 1, Dr. VERNON DAVIES moved to delete from the first Subsection the words "for mental illness." He said that the elimination of these words would not have a detrimental effect on the Bill, and would simply bring it into line with the Lunacy Act. He thought that the amendment would have a very material effect in encouraging people to come at the earliest moment to submit themselves to treatment.

Mr. GREENWOOD (Minister of Health) said there was nothing derogatory in describing in a Bill the plain fact about the disease from which a person was suffering. They must define diseases, and there could not be any words less objectionable and more neutral than the term "mental illness." There was a difference of medical opinion on this matter, as was shown in Committee, and therefore it was better to retain the words. He did not think that voluntary patients would be deterred by them from seeking treatment. Already they went in large numbers to these institutions.

The amendment was negatived.

The Board of Control and the New Service.

Mr. KINLEY moved an amendment to dissociate the Board of Control from any connexion, direct or indirect, with the new service for the treatment of voluntary patients, and to substitute for the Board the Minister of Health. He said that the amendment was of fundamental importance, and on the decision of the House upon it would depend whether the Bill would be of real value to the public. He (Mr. Kinley) was whole-heartedly in favour of this new public health service for the prevention of lunacy, but he held that the Board of Control should have nothing whatever to do with it, otherwise it would be doomed to failure. The Board of Control have been condemned in the public mind for many years, and that condemnation had been lately justified because the Royal Commission had stated that the Board as hitherto constituted was not worthy of continued existence. Fundamental alterations in the constitution of the Board were proposed in this Bill. He did not say that the individuals who comprised the Board of Control had been responsible for the failure, but he did suggest that the record of their work so far as they could ascertain from statistics proved that if there was one thing that was important in their public health service it was that the Board should not be permitted to enlarge its scope until it could prove to the nation by results that the power it possessed had been well used. From all that he could discover there was no justification for any statement that the Board had been successful. He was amazed that long before now there had not been a minute and severe investigation into the whole of the operations of the Board. In answer to questions addressed to the Minister of Health during the last few weeks he had ascertained that on the average 22,000 people were admitted to asylums every year, and that over 30 per cent. of these were recorded as deaths within 12 months. Over a period of ten years out of the 22,000 admitted each year, 10,000 were discharged, and 8000 or 9000 died. Over the same period the number of suicides had increased from 49 in the first of the ten years to 61 in the last year; another reason sufficient to condemn the Board of Control. According to a reply given to him only a week ago by the Minister of Health, in the publicly owned institutions the patients had the advantage of the service of a resident medical officer to the extent of one doctor for 280 patients. Under no circumstances could the arrangement ever give the results that they were entitled to demand.

Mr. MESSER, in seconding the amendment, said that the Board of Control had outlived its usefulness at least in the eyes of the public authorities who had been appointed under the Ministry of Health to discharge the functions necessary in dealing with mental cases. The Board was necessary in the days when private institutions were the only ones dealing with cases of this kind, and when it was necessary in the public interest that there should be close examination of all complaints concerning institutions for mental treatment. But as time had gone on county councils had found the Board of Control not a help, but a hindrance.

Sir KINGSLEY WOOD said there was not a word in the report of the Royal Commission to support the rather reckless statements that had been made that day. The proposal of the amendment to substitute the Minister of Health for the Board of Control in regard to these voluntary mental patients involved considerable administrative difficulty. It would mean a duplication of machinery and of staffs which would be very unfortunate unless there was overwhelming necessity for it. He thought that the Board of Control would give a measure of protection to the persons who took advantage of the treatment under this Bill. He hoped that it would be possible for the Minister to retain the lay element on the Board of Control, as it would strengthen the Board in the eyes of the public.

Colonel WEDGWOOD begged the House to consider that the liberty of the subject was one of the most sacred charges upon every Member of Parliament. Every British citizen should have at least some appeal to a court to escape from the control of the expert and the bureaucrat.

A Defence of the Board.

Dr. MORRIS-JONES said that Colonel Wedgwood objected to mental patients being treated by an expert. Who did he suggest should treat them? The right hon. gentleman, he assumed, to save his life would submit to a grave operation at the hands of a surgeon, but he would not trust a medical commissioner in lunacy.

Colonel WEDGWOOD: I should choose my own surgeon.

Dr. MORRIS-JONES said that liberty, after all, was a limited matter, and he was sorry to hear the very strong remarks that had been made about the Board of Control. He realised that Mr. Kinley had moved this amendment quite sincerely, but he suggested that he was entirely misinformed and misguided, and he had made references to a body which was doing very difficult work which were not worthy of his work during the committee stage. The Board of Control were dealing with thousands of people, not one of whom was normal mentally, and he (Dr. Morris-Jones) thought they had done their work extraordinarily well in the circumstances. Their name was unfortunate. The British people did not like the word "Control," and it was very unfortunate that in 1913 they were given the name of "Board of Control." He would read to the House the views of a great expert, Sir Maurice Craig, on the Board. Sir Maurice had stated:—

> "I am aware that there is a diversity of opinion as to who should be the central authority responsible for supervising patients in the early stages of mental disorder. For many years I felt, with others, that the Board of Control were too much steeped in the traditional treatment of mental disorder, and that it might be difficult for them to free themselves from this outlook, and in consequence I feared it might, in practice, be difficult to have the body visiting patients who are not insane. But it has been impossible to watch the work of the Board of Control during recent years without appreciating how much they have taken up the more modern views of psychological medicine, indeed, they have shown such power of adapting their functions to the medical outlook and I am now of opinion that this body is fitted to undertake the supervision of all mental patients, including those in the early stages of illness."

That was an unbiased opinion. This was the conclusion which the Royal Commission came to in regard to the Board:—

> "We are satisfied that the criticisms to which this Department has been subjected are to a large extent ill-informed, and that where criticism is justified the cause is to be found rather in defects in the existing system than in any want of zeal on the part of members of the Board. Having had opportunities of observing the care and thoroughness with which their work is done and the wide scope of their activities and their vigilance, we think that the Board have discharged their duties under the present code in a manner deserving of great commendation; but they are handicapped by three factors beyond their control."

That was a very fitting and unimpartial testimony to the Board of Control. Voluntary patients under this Bill would gain tremendously from the protection afforded by the Board of Control. It was amazing to him that the Board should be so constantly assailed on all sides. He was sure that they were quite prepared to go on doing their work conscientiously in spite of any criticism. He (Dr. Morris-Jones) had great hopes in regard to Clause 1. Medical men would make great use of it, and try to get patients voluntarily to seek early treatment.

Non-Certifiable Treatment for the Masses.

Mr. GREENWOOD said that Clause 1 did not represent the views of bureaucrats or experts, but the conclusions of the Royal Commission. The voluntary patient had existed under the law for a considerable time, and all that they were trying to do in this Bill was to render this early form of non-certifiable treatment, which at present was available only for the well-to-do, available also for the mass of the people. The experience of the voluntary patient system in the past showed that the Board of Control had really not been a force working against the success of the system. During 1929 there were admitted to registered hospitals 562 certified patients and 668 voluntary patients. In the

case of licensed houses, 974 certified patients were admitted and 757 voluntary patients. The point was that nearly one-half of the entrants into registered hospitals went in voluntarily. Therefore, there was not in the minds of these people that fear which had been suggested. By this amendment the House was not asked to abolish the Board of Control, or to supersede it by the Ministry of Health. That would require a very far-reaching Bill drastically amending the principal Act of 1890. Obviously that could not be done in this Bill, particularly at the present stage. What the amendment asked was that the Ministry of Health should be directly responsible for certain aspects of mental illness, whilst retaining the Board of Control for the major portion of the responsibility for such illness. That would mean that in most cases there would be going to the same institutions medical visitors of the Board of Control and of the Ministry of Health. There would be duplication of inspection and of administration. The problem was more complicated than that. Hon. Members must not suppose that the voluntary patient was in a category which was unalterable, or that if he came under Clause 5 he would always remain so, or that if he was certified he was certified for ever. These three categories of persons were ever-changing. Mental disease took many forms; it was more acute in some cases than others, and one form passed into another. It seemed to him bad administration to take one particular category of people suffering from mental illness and to say that they should be supervised by the Ministry of Health, and that the other categories should come under the supervision of the Board of Control. What were they going to do about the people who oscillated between one category and another? Hon. Members were asking for an administrative system which no Minister would pretend to work, because it would be utterly impracticable.

Mr. WOMERSLEY asked the Minister whether he would accept an amendment giving the local authorities a right of appeal to the Minister of Health against any decision of the Board of Control?

Mr. GREENWOOD: On that matter I stand precisely where I stood during the Committee stage.

Mr. BECKETT said that during the six years he had been a Member of the House he had been brought into touch with the Board of Control on a great number of occasions, and he could not remember a single case in which he had felt satisfied when the case was finished that the right thing had been done. He could not remember a case where the correspondence from the Board was, in his opinion, fair, honest or candid. His experience was that the Board always sought to detain persons under their control. In one case he was able to trace all their lies, their malevolence, their libellous statements and their maliciousness. He took the matter to the Ministry, and finally, by threats of publicity, he was able to get an apology. A case like that left a very uncomfortable feeling in the mind that in many cases in which he had failed, had he been able to get as much information as he did in this case, and had the Board of Control made one little slip in their facts, as they made in this case, he might have been able to do much more. His experience of the Board of Control had convinced him that it was permeated by the very worst type of charity organisation mentality. He wished they could have got the Minister to meet them on this point. No one said that this Bill was unnecessary; it would do a lot of good, but it was giving increased power to a body over which the House had no effective control, and in which a great many Members had no confidence.

Dr. VERNON DAVIES said that they had listened to a rather unfortunate speech in which a Member of the House had thought it necessary to make a distinct and deliberate charge against the Board of Control. The Board could not answer for themselves, and although he had no love for officials as a class, and believed that there was a great deal to be said against the introduction of a new despotism, he did not think that officials should be subjected to a charge in that House unless the Minister was given an opportunity to reply. He (Dr. Davies) could not agree to this amendment because one of his principal objections to the Bill was that it lowered the status of the Board of Control. Certain hon. Members seemed to have a wrong idea of the functions of the Board. It could almost be described as a judicial body. They acted as judges on all documents or medical certificates to see that they were absolutely in order. They were the guardians of the liberty of the subject. The power of a body like that should, if possible, be increased. To reduce them in status, as was being done under this Bill, by placing them under the Minister of Health, weakened their position. They would simply become a department of the Civil Service. He went further and said that they would have a new tyranny. If Members asked a question the Minister of Health would only tell them what he wanted them to know, or what his department wanted them to know.

The amendment was negatived by 205 votes to 18.

Mental Hospitals and Voluntary Patients.

Mr. WINTERTON moved an amendment to provide that unless a voluntary patient was of unsound mind within the meaning of the Lunacy Acts 1890 to 1922, he should not be received as a patient, either rate-aided or paying, in a public mental hospital. He asked whether the Government or anyone else who supported this Bill suggested that an ordinary lunatic asylum was the proper place in which to treat these patients? THE LANCET had said a little while ago: "If a person with mental disturbance voluntarily asks for treatment in a hospital or home, why should he more than any other invalid have to be notified to the Board of Control?" There seemed to be no ground whatever for saying that a voluntary patient should be treated in exactly the same way as a hopeless lunatic.

Mr. BROCKWAY seconded the amendment.

Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that these patients could no more be "sent" to any place than any Member of Parliament. They were not lunatics, but people who were a little worried about themselves, and they went into the institutions which dealt with all classes of cases, varying from lunacy to the mildest form of mental worry. There was no clear-cut distinction between a case of hopeless melancholia and a person who had become depressed. If that were so, what was the sense of saying that the same institution should not be allowed to treat the extreme forms of a disease and the mild forms of the same disease? She thought it very likely that, with the enormous amount of fresh institutions coming into the hands of the local authorities, where public opinion would allow it they might set apart separate buildings if they found a reluctance on the part of voluntary patients to go into the other mental institutions. But at present people did go to the mental hospitals.

Dr. VERNON DAVIES said at the present time there was no other accommodation for these patients except the mental hospitals, and though he was bitterly opposed to sending them to those hospitals, which were already overcrowded, he recognised the difficulty. Pressure must be exerted on the local authorities to supply other places for these people. Under the new Local Government Act, the borough or county councils could establish convalescent homes for these cases where they could be free from the ordinary asylum environment. But, of course, they would have to be under the care of a medical man with some experience of the subject. At present, however, they must include the mental hospitals as places for the accommodation of these cases.

Lieut.-Colonel FREMANTLE supported the views put forward by Miss Lawrence and Dr. Davies.

The amendment was negatived.

Notice of Reception, Death and Departure of Voluntary Patients, and Provisions as to the Discharge of Patients.

On Clause 2, Colonel WEDGWOOD moved an amendment which proposed to qualify the reference in Clause 1 to persons becoming incapable of expressing themselves as willing or unwilling to continue to receive treatment by requiring that they should be so incapable "in the opinion of a magistrate."

Mr. GREENWOOD said that he was in favour of the exclusion of magisterial interference to the greatest possible extent. The real objection to the intervention of a Justice of the Peace was that it had always been associated in the public mind with certification.

The amendment was negatived by 192 votes to 30.

The further consideration of the Bill on Report was adjourned.

POST-GRADUATE MEDICAL STUDY.

In the House of Commons on April 9th Mr. NEVILLE CHAMBERLAIN asked the Minister of Health what action the Government proposed to take on the Report of the Post-graduate Medical Education Committee.

Mr. GREENWOOD (Minister of Health) replied: In view of the public interest in this matter I hope that the House will permit me to make a statement which exceeds the usual limits of a reply to a question. The Committee was appointed by my predecessor. He was as Minister of Health its chairman and I succeeded him. The Report will be in the hands of Members to-day. The proposal of the Committee is that in order to remedy the most serious outstanding defect in the existing provision for the education in medicine of post-graduate students, a British Post-graduate Hospital and Medical School should be established in London.

Organisation and Financial Position.

The organisation of the British Post-graduate Hospital and Medical School recommended by the Committee consists

of an existing public hospital, the Hammersmith Hospital, with 400 beds in modern wards, which on April 1st became the property of the London County Council under the Local Government Act, 1929; a medical school in conjunction with the hospital; and a residential hostel on a site in central London. The Committee estimate that the financial provision required to establish and maintain the British Post-graduate Hospital and Medical School, apart from the cost of the maintenance of the beds in the public hospital, which in their view should remain, as it is now, a charge on the ratepayer, will be as follows: First, a capital sum not exceeding £250,000 for building a medical school, which together with the hospital will form the main part of the new organisation, and for providing educational equipment. Secondly, the sum necessary to maintain the medical school as a recognised school of the University of London. Thirdly, the capital cost of building the residential hostel. The Government have accepted the recommendations of the Committee as to the organisation of the British Post-graduate Hospital and Medical School. They are much impressed with the importance of securing without avoidable delay the advantages of a proper system of post-graduate medical education in London, not only from the domestic, but also from the Imperial and from the international points of view. The Government will, accordingly, be prepared to contribute from public funds a maximum sum of £250,000 for building and equipping the medical school as an integral part of the scheme recommended by the Committee; and to make provision for grants through the University of London towards the maintenance of the school on the lines already applied to comparable institutions of university rank. The Government earnestly hope that they may secure the coöperation of the London County Council and of the University of London in the scheme as recommended by the Committee, and they are entering into communication with those bodies on the subject.

"*London House.*"

The Government understand that an appeal will shortly be made to the public for assistance in the establishment in London of a residential institution to be called "London House" for the use of students from the Dominions not only in medicine but in other arts and sciences. It is also part of the proposed scheme that "London House" shall offer accommodation to a limited number of British students domiciled in Great Britain and Northern Ireland in order to furnish collegiate association between them and students from the Dominions. Such an institution would, in fact, secure the object aimed at by the Post-graduate Medical Education Committee in recommending the provision of a hostel. The Government are in full sympathy with the movement and they look forward with full confidence to the success of the appeal when it is made as crowning a scheme to which the taxpayer, the ratepayer, and the general public will be contributing their appropriate shares

Expansion if Required.

Mr. CHAMBERLAIN: I am sure that the statement which the right hon. gentleman has just made will give profound satisfaction as soon as its full implications are appreciated. In congratulating him upon the final success—which I am sure he will agree is largely due to the very distinguished body of surgeons and physicians constituting the Committee—may I ask him whether the hospital which has been chosen is considered to have a sufficient number of beds for the purpose for which it is required, and whether, if not, there is room for extension if it is considered desirable?

Mr. GREENWOOD: Yes, Sir. The scheme envisaged by the Committee makes provision for a larger number of beds than is now available at Hammersmith. The Committee were unanimous in their choice of Hammersmith, and there is sufficient available ground for extension and the number of beds to make the hospital effective.

Mr. MARLEY asked whether it was proposed that colonial students as well as students from the Dominions would be able to reside at "London House," as there were post-graduate students from Africa taking courses in tropical medicine?

Mr. GREENWOOD: If I used the term Dominions narrowly I am sorry. The hostel will be available for students from all parts of the British Commonwealth.

In answer to Miss RATHBONE, Mr. GREENWOOD said that men and women would both be included in the scheme, but the scheme was intended for post-graduates and not for ordinary students. It was to assist people who already possessed qualifications.

Miss RATHBONE: Does the right hon. gentleman not think it likely that women students will be included among post-graduate students?

Mr. GREENWOOD: Yes, certainly.

HOUSING (SCOTLAND) BILL.

On April 10th, Mr. ADAMSON (Secretary of State for Scotland) in moving the second reading of the Housing (Scotland) Bill, said its object was to secure that the slums of Scotland, which had long been a standing reproach, should be done away with, and that in place thereof there should be houses of adequate size in which healthy, happy lives could be lived. The report of the Royal Commission on Housing in Scotland, which was issued in 1917, revealed a picture of the housing conditions in Scotland as a whole which showed unsatisfactory sites of houses and villages, insufficient supplies of water, unsatisfactory provision for drainage, inadequate provision for the removal of refuse, widespread absence of decent sanitary conveniences, houses in many of the mining areas badly constructed, incurably damp labourers' cottages on farms, whole townships unfit for human occupation in the crofting counties and islands, and primitive and casual provision for many of the seasonal workers. That Commission recommended that there were required in Scotland 121,430 houses to meet the needs of the people.

The Commission were not satisfied, however, with the standard of housing accepted at the time of their report, and they were strengthened in that opinion by a reference to the census figures which showed that half the houses in Scotland were of one and two rooms only. They recommended, therefore, the raising of the standard, and to achieve this it was estimated that an additional 114,560 houses were required or a total of 235,990 houses before the people of Scotland could be regarded as adequately housed. Each Government since the issue of the Commission's report had made its contribution to the solution of this problem, and although up to Feb. 28th last, the latest date for which returns were available, there had been provided under all forms of State assistance by local authorities and private enterprise a total of 107,451 houses. As it was estimated that 10,000 houses were required annually in Scotland to meet the normal needs and to provide for the new yearly demands, it would be realised that since 1919, when the first scheme of Government assistance was passed by Parliament, building operations had, on the average, only just kept pace with the normal needs of the Scottish people.

The Problem of the Slums.

However commendable the efforts of the local authorities up to date had been, the houses built had not succeeded to any extent in solving the problem of the slums, or the housing of the poorer section of the community. Some steps, however, had been taken in that direction with the aid of the 50 per cent. grant under the 1923 Act, and 11,205 houses had been built at low rents, specifically to take the place of houses which were occupied but were unfit for human habitation. This, however, was only a small contribution in comparison with the magnitude of the problem. In 1919 the local authorities in Scotland estimated that 34,755 houses were required to replace houses that should be closed, while 41,880 houses were required to relieve overcrowding. Recent available figures indicated that there were at least 13,000 houses occupied in Glasgow that should be closed; in Edinburgh over 5000; in Greenock about 14,000; in Dundee about 2000; and in Aberdeen about 1500; besides a large number in other parts of the country for which he would not attempt to give figures. Overcrowding was not confined to what were generally known as slum areas; it was just as common outside those areas, and in the interests of health, decency, and morality it must be prevented if possible. According to the latest census returns, more than 2,000,000 persons in Scotland, or over 43 per cent. of the population, were living more than two in one room.

Re-housing Grants.

The Bill proposed that grants should be given not only for the re-housing of persons displaced by the closing of uninhabitable houses, but also for those displaced by the operations of a local authority to abate overcrowding. The Government proposed to work through the local authorities, who would be given State assistance. Experience had shown that certain improvements in the machinery for clearing slums were necessary, and the Bill embodied those improvements. It was necessary to separate the clearance procedure from the development procedure, and this constituted the main difference between the procedure under the present law and that proposed under the Bill. Part I. of the Bill dealt with the clearance or improvement of unhealthy areas. Part II. dealt with the repair, demolition, or closing of insanitary houses. Under Part III. local authorities were required to consider the housing needs of their district from time to time, and as occasion arose, to submit proposals to the department for the provision of new houses. The financial proposals contained in Clauses 19 to 21 substituted for the present percentage grant a new

State grant which would take the form of a fixed sum per person displaced for whom re-housing had been provided consequent on the operations of the local authority under the Bill for the closure and demolition of defective houses, and the abatement of overcrowding. The amount of the assistance granted by the Exchequer, together with the contributions from local rates, would enable a local authority to provide houses for the larger families at rents suitable to their needs. The larger the number of apartments in a house, the larger would be the grant. To meet the demands of local authorities the grant would be available where they provided accommodation for single persons in hostels. In addition to the grant per person already referred to, there would be an additional grant to meet the expenses of local authorities who had to pay compensation for good property which had to be demolished under a clearance or compulsory purchase order.

Slum Clearance Schemes.

Major ELLIOT said that all Members of the House would sympathise with the objects which Mr. Adamson had in view in this Bill, but the measure would require close examination to see whether it actually carried out those objects. In Scotland slum clearance schemes had not suffered the entire collapse which apparently had been the case south of the border. On a population basis, local authorities in Scotland had done eight or ten times as much as had been done in England and Wales. Some 10 per cent. of all the housing in Scotland had been directed to the clearance of the slums. The opposition did not intend to challenge the second reading of this Bill, or the financial resolution which would be considered later. At the same time he was afraid that the financial proposals would cause apprehension in the minds of local authorities that they would not be very much better off under this Bill than they were before. The new machinery proposed seemed in some places to simplify the procedure, but he would like to get a little more milk for the bantling. He suggested to Mr. Adamson that he should once more approach the Treasury and not give way until he had got an assurance that the introduction and not the passing of this Bill should be the date from which the new grants would commence.

Mr. MACPHERSON said the Bill did not go far enough in compelling local authorities to take action.

Mr. BUCHANAN said that he welcomed the Bill and would do what he could to help in its passage, but he was under no illusion, representing the great mass of poor people, that there was any hope for them unless this or some other Government brought to those poor people the means of obtaining an income sufficient to meet their bodily and mental requirements.

The History of Scottish Slums.

Mr. BUCHAN said there were certain reasons for the special character of the Scottish slums which made it necessary to treat them as a separate problem from those of England, and one of those reasons lay in their history. The conditions of life in an older Scotland were very favourable to slum-making. They were a poor people, and did not enjoy a clement climate. They were for a very long time under a constant threat of invasion from the south, and so were compelled to huddle together for security. As a result they were not a very hygienic people. It was often forgotten that until the end of the eighteenth century the Scottish nobility and gentry in Edinburgh lived under slum conditions in horrid little flats without light or air, with a filthy common staircase, and in the streets heaps of offal and garbage, and pigs and hens running about them. Sir Walter Scott was born in a slum which would have horrified any modern reformer. He had six brothers and sisters who died in infancy because of these slum conditions. The first attempt at slum clearance in their history was the migration from the old to the new town of Edinburgh. The second reason for the special character of the Scottish slums lay in the way the industrial revolution came to Scotland. In a decade or two the whole face of the country was changed, and the balance between town and country was upset. Men and women were herded into new insanitary barracks, or into the overcrowded tenements of Glasgow or Edinburgh. There was little foresight in the whole business, and for a long time the country was entirely unaware of the problem. Before the national conscience awoke the problem had become almost insoluble. The result they know to-day. They had seen it only too clearly in unhealthy children and stunted men and women. The standard of height and physique of the Scottish soldier had had to be steadily lowered. There was another special character of the Scottish slums, and that was there was no slum clearance by natural causes. The old stone tenements of Glasgow or Edinburgh did not tumble down; they became yearly more filthy, but they remained standing. Some of the new barracks, which were now slums, were built on old greens and closes behind tenements back to back. The result was that slum clearance in Scotland must be a much more intricate and more drastic thing than in any other part of the kingdom. This Bill attempted to expedite the work of improvement, not a great deal, but a little. He found himself in general agreement with its provisions, and he hoped that it would speedily be passed into law.

After further debate the Bill was read a second time without a division.

The House afterwards went in Committee on the financial resolution connected with the Bill, and after some debate this was also agreed to.

MATERNITY AND CHILD WELFARE.

On March 31st, on the motion that the Speaker do leave the chair on the House of Commons going into Committee of Supply on the Civil Estimates and Estimates for Revenue Departments, 1930,

Sir KINGSLEY WOOD raised the question of maternity and child welfare. He said that so far as infantile mortality was concerned the country could congratulate itself on the position, but the maternal mortality-rate was nothing like so encouraging and caused a considerable amount of disquiet. A considerable improvement in the carrying on of the work in connexion with these two matters would be obtained by transferring it from the smaller local authorities to the larger bodies like the county councils. Under the larger authorities there was a school medical service. If they could coördinate the work in connexion with maternity and child welfare, and link it up with the larger authorities, they would secure coördination of that work with the school medical service of the local authority. That would be a very great gain, which would be lost if they relied on the smaller local authority. They would practically have continuity in the supervision of the health of the children from birth up to the school leaving age. There was no country in the world which was as proud of its voluntary institutions and of their work as was this country. All classes of the community joined in assisting the voluntary agencies and the voluntary hospitals. He hoped that the representative of the Ministry of Health would assure the House that the Ministry were going to assist in every way they possibly could the work both of the local authorities and the voluntary agencies. He was glad to see that one of the matters which arose in connexion with the Estimates was that of health visiting. That work was becoming more and more appreciated, and almost equally with the work of the medical man and the midwife. What steps had been taken in the last year to improve the training of midwives?

Maternity Services for Antenatal Clinics.

Miss LAWRENCE, Parliamentary Secretary to the Ministry of Health, in reply, said that it was stated that special money was required for infant welfare. That was one of the services which had been taken away from proportional expenditure and had been placed under the block grant, which was stereotyped for a term of years. They could not give any more money for that purpose unless they tore up the Act of 1929. The average figure of maternal mortality had remained steady for a period of years over the whole country. Some years it fluctuated up and sometimes down. There were two committees dealing with the question. One was the Departmental Committee on Medical Research, which had already received confidential reports on individual cases. That committee was on the point of making a report. The second committee was dealing with the training and assistance of midwives, and had already reported. That subject raised a very large number of questions of great difficulty, which would involve further legislation. The difficulty was to obtain proper maternity services for antenatal clinics and advisory clinics, and more coöperation on this subject was wanted between national health insurance work and the work of the local authorities. The matter was receiving the attention of the Ministry, but the question of legislation had not been fully explored up to the present by the Ministry of Health. There was no form of health work where the results in proportion to the expenditure were more gratifying than that of advice to expectant mothers. The work of public education in this matter was very important. The percentage of expectant mothers who attended antenatal clinics in Woolwich, where there was a really thorough, good, healthy propaganda, was 40 per cent. The percentage in Bermondsey was 35; in Bristol, 27; Manchester, 13; and Gateshead, 15. The problem was not insoluble. It raised very intricate questions which Parliament would do well to consider. If the local authorities would use their powers to the full and conduct a great campaign of public education to bring up the level of the backward authorities to that of the best, they would see, not a complete solution, but a very gratifying improvement in this service.

Mr. MELLER urged Miss Lawrence to consider the development of the maternity and child welfare clinics, and not to

ask for too much support and coöperation under the National Health Insurance scheme. He said that too much stress was laid on this point, and there was a greater desire to get hold of some of the money for the pockets of the doctors than to provide the health-giving services which should be the main object.

Major GLYN said that he did not want to say anything against the medical profession. It was known what wonderful work was done by doctors, but he often felt that, since the panel system came into force, there had been an inclination on the part of some doctors rather to lie back and not keep to the front of their profession. There was the feeling: "I am a panel doctor, and these people have to come to me. Here am I. I am going to give them so much medicine and get so much for it." One of the most important things with regard to educating the community was to give that public sense of the decencies of life which a man must show towards his wife. There was no doubt that many cases of maternal mortality and infant death were due to the selfishness of the husband. It was not a matter for the medical profession but for public opinion. If possible, perambulating clinics should go on motor lorries to isolated villages and be available to explain to married women the main principles of the ordinary rules of life which people in cities could obtain by going to clinics.

The Tragedy of Maternal Mortality.

Dr. VERNON DAVIES said that he regretted that the debate seemed to have developed into a more or less underhand attack on the medical profession. For an effective maternity and child welfare service they must have doctors. The maternity service of a medical man was an extremely onerous service. He had attended hundreds of confinements for ten days and stayed up all night for a guinea. He would not like to start again. They would find that practitioners were not now inclined to give their time to this work, and there was a tendency for the maternity service to get into the hands of particular doctors and certified midwives. That was a move which had the hearty sympathy of all medical men, because there was no doctor who had anything of a practice who could afford to spend hours on end waiting for some poor woman to be delivered of a child. It was better that certified midwives should attend to cases which lasted so long; they could send for a doctor if necessity arose. Unless the medical man and the midwife were adequately remunerated there would not be an effective maternity service. The question of maternal mortality was one of the greatest tragedies in the life of the nation to-day. Yet the peculiar thing was that it was not of necessity that they got these puerperal cases in the slums. Puerperal fever did not depend on slums, although they naturally did not want women to give birth to children in the slums. There was a tremendous shortage of beds for maternity cases in the country. According to the last report of the Ministry of Health there were 2480. It seemed appalling that there should only be that number for nearly 670,000 births. A method which could be much extended by the Ministry of Health through the local authorities was that they could take over, not what he called municipal maternity homes which were coming into existence, but large houses which had become more or less derelict. If these were made available for maternity homes they would prove a great boon. The need for antenatal work had now become very well recognised, but here again the whole success depended first of all on the doctor, and, secondly, on the nurse. Education and propaganda were needed so that the women of the country, especially the young married women, should realise that it was to their advantage and to that of their baby that they should be examined as early as possible in pregnancy, so that if things were not in order precautions could be taken. There was a Committee sitting to inquire into the training of midwives. He believed that the Ministry of Health had some idea of either doing away with or relaxing some of the regulations of the Central Midwives Board. That would be a retrograde step. The Central Midwives Board had done extraordinarily good work and were doing that work to-day. It should be the duty of the Ministry, instead of handicapping that institution, or interfering with it, to do all they could to encourage the Board in their work. It was also necessary to see that there was efficient after-care and that there were competent health nurses. He was glad that the Ministry of Health insisted that health visitors should possess the health certificate, but there was one great danger which applied to health visitors as well as to other nurses. It did not necessarily mean that a person with the best certificate or with the largest number of degrees was the best person for the work. There were such things as professional tact, common sense, and motherliness.

The Need for Pure Milk.

Another point on which the Ministry might exercise a certain amount of control was the feeding of children. This country was perhaps not so far advanced as it should be in the matter of pure milk. Every effort should be made to see that women suckled their own children, because mothers' milk was best for the child. The Ministry might concentrate more than they did on the question of pure milk. They should pay more attention to the unsweetened condensed milk which was imported from the Continent in such huge quantities, and which the late Minister of Health said was not fit for babies. People bought this milk because it was cheaper than ordinary milk, and in many districts children were being fed on milk which was bound to do them harm. This condensed milk from abroad should not be allowed to be sold, retail, in less than 7 lb. tins. That would immediately stop the sale of the 4 oz. tins, and people would be compelled to provide one of the dried milk foods, or, better still, pure milk from the cow. Our milk-supply required looking into. The amount of adulteration which went on was a disgrace to our civilisation, and very often they found in the residential towns the worst milk-supply. Surgical tuberculosis in children, one of the most dreadful of diseases, was undoubtedly due to tuberculous cow's milk, yet how often was the milk examined for tuberculin? There was tuberculin-tested milk, it was true, but ordinary people could not afford to pay for it. The first duty of the Ministry of Health was to see that the children were fed with tuberculin-tested milk to give them a chance of a good start in life.

Birth Control.

Another subject in connexion with maternity and child welfare centres was the very vexed subject of birth control There was an agitation spreading to certain parts of the country, and among members of the Socialist party it was becoming more and more a political question, that the Government should give doctors at antenatal centres power to inform inquiring mothers as to methods of birth control. The competent medical opinion of the country was definitely opposed to birth control. (Mr. THURTLE: "Rubbish.") Only a few weeks ago a meeting of a medical society was held in London to discuss this very point, and the opinion was overwhelmingly against birth control. Therefore, when people said that they were in favour of birth control they were speaking from ignorance.

Mr. THURTLE asked if Dr. Davies thought that Lord Dawson of Penn was not a very good medical authority, and was he aware that Lord Dawson was strongly in favour of birth control?

Dr. DAVIES said that in the first place Lord Dawson was not an obstetrician. He was a physician generally, and he (Dr. Davies) probably had attended very many more confinements, even as a general practitioner, than Lord Dawson had ever done. Because Lord Dawson happened to be a swell physician it did not mean that he was really a competent authority in deciding that question. When he (Dr. Davies) was speaking of competent medical opinion he was speaking only of the gynæcologists and obstetric surgeons whose work was concerned with maternity and the diseases of women. They were competent to judge because they saw the ill-effects of birth control. Lord Dawson would probably never see the ill-effects of a case like that, which was outside his line of practice. Any obstetric surgeon or medical man or woman accustomed to a large gynæcological practice almost without exception would say that birth control was detrimental to the woman and to the child. He hoped that the Government would persist in the attitude which they had adopted up to now and would refuse to instruct any of their medical officers at the centres to give information on birth control.

An Underpaid Service.

Miss RATHBONE said that she hoped that the Ministry of Health would very quickly put part, at any rate, of the report on midwifery training into practice. The midwifery service was extremely ill-paid. Many of them doubted the wisdom of the recommendation in the report that would place the whole onus of training, and of preparing the syllabus for the training of midwifery, on medical officers of health rather than on the Central Midwives Board. There was always the fear that the medical officers of health had too little practical experience in this kind of work and were too much under the thumb of local medical opinion.

The motion was agreed to.

THE BUDGET.

Mr. SNOWDEN (Chancellor of the Exchequer) made the annual Budget statement in the House of Commons on Monday, April 14th.

He said that he proposed an increase of 6*d.* per £ in the standard rate of income-tax. The existing graduation would be revised to protect small incomes. Instead of giving relief of 2*s.* 3*d.* on the first £225 of taxable income, the relief would be 2*s.* 6*d.* on the first £250. This would mean that in the case of an unmarried or widowed person

with an income, all from investment, not exceeding £485, or with an income, all earned, not exceeding £582, there would be no increase in the income-tax bill. The same was true in the case of a married man with three children unless his income from investment exceeded £735, or, if earned, it exceeded £882. Income-tax payers talked as if they paid 4*s.* in the £ on all their incomes, but out of 2,250,000 income-tax payers there were not 50,000 who paid the full standard rate of 4*s.* No person with an income below £3000 paid the full rate, and the great majority did not pay more than from a few pence to 2*s.* in the £. As regarded life insurance, the old rates of 2*s.*, 3*s.*, and 4*s.* would remain unchanged. The extra 6*d.* on the income-tax standing alone would produce about £29,000,000 in a full year. Allowing for the cost of change in graduation (£5,000,000 in a full year), the yield would be about £24,000,000 in a full year and £21,000,000 in the current year. As regarded the surtax, he proposed to correct an anomaly by placing it on the basis that the rate of tax payable in any year would fall to be determined by the financial needs of that year. The increase in the standard rate of income-tax would, of course, be borne by surtax payers as well as other income-tax payers. But the financial needs of the current year were such that he felt bound to call upon the surtax payers to supplement the additional payment of income-tax by an additional surtax. He proposed an increase in the initial rate from 9*d.* to 1*s.* in the £, and in the case of incomes over £50,000 an increase from 6*s.* to 7*s.* 6*d.* This would yield £12,500,000 in a full year and £7,500,000 in the current year. The capital now coming under charge to estate duty had now passed £500,000,000, and the yield of estate duty had reached £70,000,000. For estates exceeding £2,000,000 he proposed to increase the rate from 40 per cent. to 50 per cent. Amendments would be made to the existing scale from £120,000 upwards by increases of 1 to 2 per cent. from £120,000 to £250,000, with a growing increase from £250,000 onwards to reach a rate of 50 per cent. on estates exceeding £2,000,000. He expected that the yield would be about £7,000,000 in a full year and about £3,000,000 in the current year. The total effect of the changes in income-tax, surtax, and estate duty would be a yield of £31,500,000 in the current year and £43,500,000 in a full year.

Land Values—Safeguarding Duties.

As a first step to the levying of a contribution upon land values he was taking steps to prepare a valuation of all sites in the country. A separate Bill would be introduced to provide for this valuation. The £10 duty on betting certificates would be repealed as from the end of October. This would cost about £200,000 in a full year and about £180,000 this year. Four safeguarding duties under the existing law were due to expire this year—namely, lace (June 30th), cutlery, gloves, and gas mantles (Dec. 21st). The duties would be continued till these respective dates but would not be renewed. The cost was estimated at £521,000 this year and £823,000 in a full year. The Finance Bill would contain minor relief from stamp duties as they affected certain schemes of rationalisation and amalgamation. The cost would be £250,000. Small alterations proposed last year affecting motor-cycles, commercial motor vehicles between 2 and 2½ tons, and petrol electric vehicles, would take effect on July 1st in the first two cases, and on Jan. 1st in the last case. The cost would be £20,000 a year to the Exchequer and £90,000 a year to the Road Fund. The beer duty would be raised as from April 15th by 3*s.* per standard barrel, leaving rebate unaltered. This amounted to an increase of 1*d.* per gallon which was too small to justify an increase of price and the brewers had given assurances that there would be no drop in gravities. The yield would be £3,100,000 in a full year and £2,750,000 in the current year. Legislation would be proposed (*a*) to prevent (1) avoidance of estate duty on landed estates and investments through the medium of private companies; (2) avoidance of surtax by single premium insurance policies; and (*b*) to give revenue authorities rather wider powers of obtaining information in regard to ownership of income. Provisions would be made for a new assessment of all property in Great Britain for income-tax Schedule A. This would come into force for next year 1931–32, and would include the metropolis. From 1931–32 the reassessment would take place automatically at quinquennial periods. Minor provisions would be made to deal with points of hardship, or to make slight readjustments in the inland revenue duties.

National Finance.

Reviewing the national finance for the past year, Mr. Snowden said that there was an actual deficit of £14,523,000, instead of an estimated surplus of £4,096,000. Expenditure exceeded the original estimate by £6,748,000. The total national expenditure for 1930–31 (excluding self-balancing items) was estimated at £781,909,000. If provision was made for the deficit of 1929, and for a small adjustment in respect of Northern Ireland's share of the increased taxation, the total was £787,209,000. The estimated revenue was £739,645,000. The lapse of the safeguarding duties was allowed for in the estimate of £250,000,000 for customs and excise. Other minor changes involved a loss of £450,000. The increase in the beer duty, increase of direct taxation, and the Suspensory Fund would bring the total revenue up to £789,445,000, leaving a surplus for contingencies of £2,236,000.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 9TH.

Tannic Acid Treatment for Burns.

Dr. VERNON DAVIES asked the Home Secretary if the senior medical inspector of factories had reported to him on the tannic acid treatment for burns; and, if so, what decision had been arrived at with regard to its use in factories and workshops.—Mr. SHORT (Under Secretary to the Home Office) replied: Yes, Sir. My right hon. friend has received a report from the senior medical inspector. His conclusion, reached after careful inquiry, is that this form of treatment is not suitable generally for the first-aid treatment of burns at a factory or workshop. It can only be properly given in works where there is an ambulance room properly equipped and in charge of a properly qualified person, and in the treatment of minor burns it has no advantage over sterilised burn dressings. In the case of severe burns it may be valuable where the patient cannot be moved to hospital without considerable delay, but otherwise the protection of the burn by a simple dressing is the proper procedure. He does not therefore advise any modification of the existing instructions.

Dr. DAVIES: Will the hon. gentleman inform the Home Secretary that there is a very large body of medical opinion which totally disagrees with the advice that has been tendered to him?

Mental Patients and Suicide.

Mr. KINLEY asked the Minister of Health the number of cases of suicide and attempted suicide, respectively, which occurred in each of the past ten years in institutions under the jurisdiction of the Board of Control.—Mr. GREENWOOD replied: The Board of Control have no information in regard to cases of attempted suicide. In mental deficiency institutions suicidal acts are extremely rare. The annual reports of the Board of Control state each year the number of patients who have died in institutions for the insane as a result of suicidal acts committed either while in residence or on leave or before admission. The figures for the last ten years are as follow: 1920, 47; 1921, 45; 1922, 52; 1923, 39; 1924, 44; 1925, 47; 1926, 55; 1927, 69; 1928, 64; 1929, 61.

Staffs of Mental Hospitals.

Mr. KINLEY asked the Minister of Health the total of persons employed on staff duty during each of the past ten years in the institutions under the jurisdiction of the Board of Control.—Mr. GREENWOOD replied: The only figures available relate to the charge and ordinary nurses employed in county and borough mental hospitals. The numbers on Dec. 31st in each of the last ten years were as follow: 1920, 14,880; 1921, 15,439; 1922, 15,563; 1923, 15,824; 1924, 16,060; 1925, 16,460; 1926, 16,855; 1927, 17,262; 1928, 17,662; 1929, 17,748.

THURSDAY, APRIL 10TH.

Various Industries (Silicosis) Order.

Mr. HOLLINS asked the Home Secretary when he intended to introduce legislation to amend the Various Industries (Silicosis) Order; and whether he would include, within the amending Order, provision for compensation for partial incapacity due to silicosis.—Mr. CLYNES replied: Amendment of the Various Industries (Silicosis) Order to include cases of partial incapacity is dependent on the passage of the Bill which the Government have introduced to amend the provisions of the Act which relate to medical arrangements for examination and diagnosis. The Bill has already been read a second time in the other House, and it is my intention, as soon as it has passed, to take up the question of the amendment of the Order.

Birching in Borstal Institutions.

Mr. BENSON asked the Home Secretary who was the final authority to sanction birching in Borstal institutions.—Mr. CLYNES replied: Cases are very rare, only one since 1928; and when I replied to my hon. friend's supplementary question on March 31st I was under the impression that such an order would not require my confirmation.

Importation of Chemically-treated Flour.

Viscount ELMLEY asked the Minister of Health if he would briefly indicate the nature of the regulations relating

to the importation of chemically-treated flour?—Mr. GREENWOOD replied: The only regulations are those contained in the Bread Acts of 1822 and 1836, the general effect of which is that no flour may contain any ingredient not being the genuine produce of corn or grain.

Tuberculin-tested Herds and Agricultural Shows.

Brig.-General CLIFTON BROWN asked the Minister of Health whether he had considered the representations made to him by the Royal Agricultural Society and other similar societies as to the order prohibiting tuberculin-tested herds from exhibiting at their shows; and whether he could make it possible for these societies to comply with his requirements by segregating the tuberculin-tested cattle at their shows.—Mr. GREENWOOD replied: I received a deputation from the Royal Agricultural Society and two other societies, and they informed me that they are unable at present to make the requisite arrangements for segregation. The prohibition must, therefore, stand so far as the shows of these societies are concerned, but I am prepared to consider its withdrawal in the case of any shows where satisfactory arrangements can be made.

Sale of Vitacream.

Mr. HANBURY asked the Minister of Health whether his attention had been drawn to the extensive sale of vitacream, which was seriously competing with the sale of genuine British cream; and whether he would consider the advisability of amending the law so that it should be sold under the designation of cream substitute with the analysis shown clearly on the parcels exposed for sale.—Mr. GREENWOOD replied: My attention has been drawn to the sale of this article, but I regret that I cannot undertake to introduce legislation on the subject at the present time.

New Town-planning Legislation.

Lieut.-Colonel FREMANTLE asked the Minister of Health if he still considered a further measure of town-planning essential to proper housing development; and whether he proposed to introduce legislation for the purposes.—Mr. GREENWOOD replied: It is still my intention to introduce amending town-planning legislation as soon as opportunity permits.

British Spectacle Frames and Ophthalmic Benefit.

Sir GEORGE PENNY asked the Minister of Health whether, in issuing fresh regulations regarding the administration of national health insurance through the approved societies, he would stipulate that spectacle frames dispensed under the scheme should be of British origin.—Mr. GREENWOOD replied: I will consider what steps I can take to encourage the use of spectacle frames of British origin in connexion with ophthalmic benefit under the National Health Insurance Scheme.

Welfare of the Blind.

Mr. TOM SMITH asked the Minister of Health if he was aware of the suggestion of the advisory committee on the welfare of the blind that the reduction of the age limit from 50 to 40 years for the receipt of a blind pension would be fully justified; and whether he proposed, in the near future, to take any action on the matter.—Mr. GREENWOOD replied: The answer to the first part of the question is in the affirmative. With regard to the second part, this matter is under consideration in connexion with others affecting the welfare of the blind, but I am not in a position to make a statement on the subject at present.

Death-rate from Tuberculosis.

Mr. KINLEY asked the Minister of Health whether there were any local authorities whose tuberculosis figures showed little or no decline during the past ten years; and whether he proposed to take any action in the matter.—Mr. GREENWOOD replied: There are a few areas in England and Wales in which there has been little or no decline in the death-rate from tuberculosis during the past ten years. The factors which may bear upon this matter are receiving special study in my department.

Health Insurance Benefit.

Sir KINGSLEY WOOD asked the Minister of Health whether he would make a statement as to the results of the recent investigation by the Government actuary into the claims experience of a representative group of insured persons; and what action he was taking as a result of such report.

Mr. D. G. SOMERVILLE asked the Minister of Health whether his attention had been called to the statement by the controller of the Insurance Department of the Ministry of Health to the effect that the growth of sickness claims was out of all proportion to the increase in the burden of unemployment, and that a complete explanation would have to be sought elsewhere; whether such explanation was being sought; and on what lines.

Mr. D. G. SOMERVILLE asked the Minister of Health if his attention had been called to the warning of his controller against malingering on the part of persons drawing benefits under the National Health Insurance Scheme; and whether he was satisfied that the standard of administration by every society concerned was sufficiently high to ensure that additional benefits were not sacrificed by laxity.—Mr. GREENWOOD replied: I am aware of the position with regard to the increase in expenditure on sickness and disablement benefits, which has been a matter of concern to me for some time past. The report of the Government actuary on the subject will be laid on the table of the House within the next few days. The causes of the increase are under investigation by the departments concerned, and steps are being taken to deal with any laxity which is brought to light.

Sir K. WOOD: Having regard to the grave anxiety among the approved societies, can the right hon. gentleman take any steps, for instance, in connexion with medical certification under the Act? Is there any possibility of improving that?

Mr. RHYS DAVIES: Will the right hon. gentleman ask his staff to find out whether there is not a definite decline in the claims for the first quarter of this year compared with any previous period?

Mr. GREENWOOD: I cannot carry the figures in my head. I have only seen the results of the actuarial investigation in the last six days and I have not had time to examine them.

Mr. BUCHANAN: Before the right hon. gentleman takes any action will he consult the House, because the insured persons have rights equally with the approved societies?

Mr. GREENWOOD: The approved societies represent the members.

Slum Area in Tunbridge Wells.

Dr. PHILLIPS asked the Minister of Health whether any scheme had been placed before him by the municipal council of Tunbridge Wells for dealing with the slum area known as Albion-square, which consisted of 15 houses with two outside taps as their sole water supply, and had a group of water-closets in the centre of the square a few yards from the front entrances of the houses.—Mr. GREENWOOD: The answer is in the negative.

Insulin for Insured Persons.

Dr. MORRIS-JONES asked the Minister of Health the total cost of insulin supplied to insured persons for the year ending Dec. 31st, 1929; and the price per unit paid.—Mr. GREENWOOD replied: The total cost for the year was approximately £40,000. The price per 100 units was approximately 2*s.* 2*d.* during the first five, and 1*s.* 8*d.* during the last seven months of the year.

Slum Clearance in Greenwich.

Mr. PALMER asked the Minister of Health if he could state the slum-clearance areas of Greenwich selected by the local authority.—Mr. GREENWOOD replied: So far as I am aware five areas have been made the subject of representations by the medical officer of health of this borough. These are known as the Eastney-street, East-street, Charlton, Dean-street, Thames-street, and Watergate-street areas.

Nursery Schools.

DUCHESS OF ATHOLL asked the President of the Board of Education how many nursery schools local education authorities had asked him to approve as a result of the circular sent out by him some months ago jointly with the Minister of Health.—Sir CHARLES TREVELYAN replied: There are at present 37 proposals for new nursery schools before the Board, but I cannot say how many of these are the direct result of the circular.

Fumes from Electric Power Stations.

Mr. LOVAT-FRASER asked the Minister of Transport if he had received any complaints of offensive fumes emitted from electricity generating stations in the neighbourhood of Regent's Park; and, if so, what action he proposed to take.—Mr. HERBERT MORRISON replied: Complaints with regard to the emission of fumes from the generating stations in the neighbourhood of Regent's Park have been brought to my notice, and the Electricity Commissioners have been in communication with the undertakers on the subject. The London Power Company are conducting a series of tests on a full scale plant which is now in operation in connexion with one of their chimneys. The Marylebone Council have appointed a committee of experts to advise them in the matter. I do not think any further action on my part is called for at the present time.

Vaccination and Small-pox.

Mr. FREEMAN asked the Minister of Health the number of children compulsorily vaccinated in 1929, the number for whom exemption was claimed, the number of deaths of children from small-pox, and the number of deaths of children

associated with vaccination.—Mr. GREENWOOD replied: The following is the information asked for: During the year 1929, 297,627 certificates of successful primary vaccination of children under 14 years of age, and 267,044 statutory declarations of conscientious objection, were received by vaccination officers in England and Wales. During the same period, among children under 14 years of age, 12 deaths occurred which were classified to small-pox, and 16 deaths in which the words "vaccination," "vaccinia," or "post-vaccinal encephalitis" appeared in the medical or coroner's certificate. Eleven other cases of children under 14 years of age were brought to the notice of my department in which death occurred within four weeks of vaccination. In at least eight of these cases there is no reason to think that vaccination contributed in any way to the fatal issue.

MONDAY, APRIL 14TH.

Indian Medical Degrees.

Mr. FREEMAN asked the Secretary of State for India whether he was yet in a position to make any further statement on the action of the General Medical Council in withdrawing recognition of various medical degrees of India.—Mr. WEDGWOOD BENN replied: I am unable to add anything to the reply which I gave to the hon. Member on March 20th.

Mr. FREEMAN: Is the right hon. gentleman aware of the widespread indignation aroused in this matter, and can nothing be done to expedite consideration of the question?

Mr. BENN: I am sure the Government of India are fully aware of the great importance of this matter, and I am sure that they are dealing with it as expeditiously as they possibly can.

Mr. FREEMAN: Is it in the power of India to withdraw similar recognition to British medical degrees in India?

Mr. BENN: I should like notice of that question.

Major GRAHAM POLE asked the Secretary of State for India whether the Government of India had come to any decision in regard to a provisional arrangement for guaranteeing Indian medical degrees pending the introduction of legislation in the Indian legislative assembly to establish an all-India medical council.—Mr. WEDGWOOD BENN replied: The Government of India made proposals having the object indicated in the question, but these proved unacceptable to the General Medical Council. They have made no further proposals since the decision of the General Medical Council to discontinue recognition was announced.

Pension Cases and the Seven-year Limit.

Mr. RAMSBOTHAM asked the Minister of Pensions how many pension cases outside the seven years' limit had been brought to his notice since the official statement on Government policy with regard to that limit; how many had been allowed; how many were old cases; how many of these latter had been refused in spite of furnishing fresh medical evidence; and in how many cases the private doctors concerned disagreed with the findings of the Ministry's medical board.—Mr. J. A. PARKINSON, who replied on behalf of the Minister of Pensions, said: During this period, I am informed, some 9500 fresh applications have been received and about 2500 applications have been revived. Altogether 227 claims have been recognised by the Ministry during the same period, either by way of pension or treatment, though naturally it has not yet been possible to investigate more than a proportion of the recent applications. I understand that the records of the Ministry do not enable the information asked for in the last two parts of the question to be given, but that in the majority of cases no fresh material medical evidence has ordinarily been produced in support of revived claims.

Traffic in Opium and Dangerous Drugs.

Mr. MANDER asked the Home Secretary whether the French Government had now published the decree providing for direct limitation of the manufacture of narcotic drugs referred to in the report on the work of the advisory committee on traffic in opium and other dangerous drugs of the League of Nations, held at Geneva in January and February this year.—Mr. CLYNES replied: The decree was gazetted in the *Journal Official* of March 25th.

LIVERPOOL HOSPITALS.—The suggestion has been made at Liverpool that the voluntary hospitals of the city should combine to establish one large institution for all classes to obviate the necessity of building separate extensions and reduce overhead costs. Point is added to the proposal by the position of the Southern Hospital, which has a debt exceeding £40,000. Notwithstanding a grant of £13,000 from the Merseyside Hospitals Council there was last year a deficit of £2278, and a large capital outlay for extensions and equipment is immediately necessary.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

D.P.H. AND D.T.M. AND H.

Part I.—R. J. Dyson, M. S. El-Kinani, C. O. Karunakaran, *J. H. Loots, Flora H. G. Macdonald, Ethel Morris, K. C. K. E. Raja, and Joan Robinson.

* Distinguished.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—At an ordinary meeting of the College on April 14th Sir John Rose Bradford, F.R.S., was re-elected President. The following diplomas were conferred, jointly with the Royal College of Surgeons:—

D.T.M. and H.—G. H. Arndt, Shaikh Attaullah, Balkrishna, C. L. Bhola, R. C. Burgess, A. D. Cust, W. C. Davidson, Eugene Egan, A. P. Farmer, P. V. Gharpure, F. W. Gilbert, C. J. Hackett, W. R. Little, A. F. Mackay, N. M. Maclennan, W. A. Mirza, Zvi Miterstein, S. K. Mitra, C. C. Okell, G. M. C. Powell, J. T. Sorley, J. H. Strahan, W. K. Stratman-Thomas, S. H. Swift, G. E. Tilsley, E. A. Trim, L. E. Vine, N. T. Whitehead, K. L. Wig, and Francis Williams.

D.O.M.S.—S. S. Ahluwalia, Mohammad Ata Ullah, J. H. Beaumont, Athanas Blagoff, Erramilli Dikshitulu, R. R. Ghosh, W. H. Gordon, A. H. Jackson, N. M. Macindoe, A. O. Maher, I. C. Michaelson, C. C. Mukhopadhyay, Frank Phillips, Harnam Singh, A. D. Williamson, and F. C. Wilson.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council on April 11th, with Lord Moynihan, the President, in the chair, diplomas of Membership were granted to A. H. Baker (Manchester), W. W. Gerrard (Liverpool), C. C. Kapila (Rangoon and Charing Cross), and J. I. Rerrie (St. Bart.'s).

Mr. Ernest E. Ware and Prof. Frederic Wood Jones, being Members of 20 years' standing, were elected to the Fellowship.

Diplomas in Tropical Medicine and Hygiene were granted jointly with the Royal College of Physicians to 30 candidates.

The Jacksonian prize for 1929 was awarded to Mr. D. H. Patey, of Middlesex Hospital, for his essay on the Pathology, Diagnosis and Surgical Treatment of Diseases of the Salivary Glands. A certificate of honourable mention for an essay on the same subject was awarded to Mr. Reginald T. Payne, of St. Bartholomew's Hospital. For the year 1930 the subject for the Jacksonian prize is the Pathology of Ovarian Cysts and its Bearing on their Treatment, and for the year 1931 the Surgery of the Sympathetic Nervous System.

The John Tomes prize for 1927–29 was awarded to Mr. Evelyn Sprawson for his work on the chemical and microscopical structure of enamel and investigations in connexion with dental pathology. Miss L. E. Tracey, of the London School of Medicine for Women, was appointed Begley Student for the ensuing three years on the result of the recent examination in anatomy under the Conjoint Examining Board. Prof. G. E. Gask was appointed Thomas Vicary Lecturer.

It was reported that Dr. Harvey Cushing, of Boston, U.S.A., the Lister Medallist for 1930, would deliver the Lister Memorial Lecture at the College on Wednesday, July 9th.

Sir Arthur Keith, F.R.S., will deliver six Hunterian lectures on the Anatomy of Fossil Man, illustrated by recent discoveries, at 5 P.M. on Mondays, Wednesdays, and Fridays, from May 5th to 16th, at the College in Lincoln's Inn-fields.

CANCER RESEARCH FELLOWSHIP.—Under the will of the late Miss Ann Pilkington, of Accrington, £8000 of the residuary estate will be handed over to the University of Manchester for the establishment of a fellowship in cancer research.

UNIVERSITY OF BIRMINGHAM.—The Ingleby Lecture will be given on Thursday, May 22nd, at 4 P.M., by Sir John Bland-Sutton, and will be entitled the Blood Trail.—Prof. W. E. Dixon, F.R.S., will give seven Withering memorial lectures on Specific Therapy, on Wednesdays from May 7th to June 18th, at 4 P.M.—At 4 P.M. on Thursday, May 15th, Dr. C. W. Buckley will speak on Mineral Waters in Therapeutics—their Scope and Practical Application.—All these lectures will be delivered at the building in Edmund-street.

A course of post-graduate demonstrations will be given at the General Hospital, Birmingham, on Tuesdays from 3.30 to 5 P.M., and at the Queen's Hospital, Birmingham, on Fridays, 3.30 to 5 P.M., beginning on April 29th at the General Hospital and on May 2nd at the Queen's Hospital. Further particulars may be had from the clerk to the Clinical Board, the University, Edmund-street, Birmingham.

UNIVERSITY OF LONDON.—The following courses have been arranged: Three lectures on the Chemical Activities of Micro-organisms, by Dr. A. J. Kluyver, professor of microbiology in the Technische Hoogeschool, Delft, at the London School of Hygiene and Tropical Medicine, at 5.30 P.M. on Tuesday, Thursday, and Friday, May 13th, 15th, and 16th; two lectures on Some Biological Aspects of the Human Skin, by Dr. H. Leslie-Roberts, consulting physician to the Skin Department of the Liverpool Royal Infirmary, at St. Thomas's Hospital Medical School, at 5.30 P.M. on Thursday and Friday, May 1st and 2nd; three lectures on Treatment of Uterine Cancer by Radiations, by Dr. A. Lacassagne, of the Pasteur Laboratory at the Institute of Radium, Paris, at the London (R.F.H.) School of Medicine for Women, at 5.30 P.M. on Monday, Tuesday, and Thursday, May 12th, 13th, and 15th; six lectures on the Early History of Generation and Comparative Anatomy, by Mr. F. J. Cole, F.R.S., professor of zoology in the University of Reading, at University College, at 5.30 P.M. on Wednesdays and Thursdays, from May 7th to 22nd; and three lectures on Pharmacological Reactions of Involuntary Muscle, by Dr. J. A. Gunn, professor of pharmacology in the University of Oxford, at King's College, at 5 P.M., on Wednesday, Thursday, and Friday, May 7th, 8th, and 9th.

Application is invited for the Laura de Saliceto studentship, of the value of £150 a year, for the advancement of cancer research. The studentship is a part-time appointment, and particulars may be had from the Academic Registrar.

University College.—The annual dinner of the Fellows will be held at the College at 7.15 for 7.30 P.M. on Wednesday, April 30th. Sir John Rose Bradford, F.R.S., will preside.

Brevet-Colonel Sir John Marnoch, K.C.V.O., has been appointed a Deputy Lieutenant by the Lord Lieutenant of the County of Aberdeen.

ESSEX TUBERCULOSIS SANATORIUM.—On Saturday, April 26th, at 3.15 P.M., Mr. Arthur Greenwood, the Minister of Health, will open the new sanatorium at Black Notley.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual provincial meeting of the Fever Hospitals Group of this Society will be held at the City Hospital, Little Bromwich, Birmingham, at 3 P.M. on Friday, April 25th. Prof. K. Wilkinson, cardiologist to the hospital, will read a paper and give a demonstration on the electrocardiograph in the study of the heart in diphtheria.

BAYLISS-STARLING MEMORIAL SCHOLARSHIP.—This scholarship, of the annual value of about £120, with exemption from tuition fees, is tenable at University College, London. The scholar will be required to follow a course of training in physiology and biochemistry. Application should be made to the secretary of University College before May 14th.

TUBERCULOSIS IN BELGIUM.—The Belgian Cabinet have decided to set aside 100,000,000 francs (£571,400) for the crusade against tuberculosis. The National Anti-tuberculosis League will undertake the work and 2500 additional beds will be provided for the treatment of patients. The gift is intended to mark the centenary of Belgian independence.

LONDON HOSPITAL MEDICAL COLLEGE.—Two open Entrance Scholarships, each of the value of £100, have been awarded as follows: Mr. H. J. Barrie, Exeter College, Oxford; Mr. H. B. Tipler, Christ's College, Cambridge.

JEWISH HEALTH ORGANISATION OF GREAT BRITAIN. A symposium on Physical and Mental Aspects of the Jew will be held at the Conway Hall, Red Lion-square, Holborn, W.C. 1, at 3.15 P.M., on Sunday, May 25th, with Sir Humphry Rolleston in the chair. Prof. M. Ginsberg, Dr. L. Isserlis, Dr. W. M. Feldman, and Dr. E. Miller will read papers, and a discussion will follow.

BRITISH ORTHOPÆDIC ASSOCIATION IN DUBLIN.—The first meeting of the British Orthopædic Association to be held in Dublin took place on April 11th and 12th, under the presidency of Mr. R. C. Elmslie. Some 30 members were present. The meetings were held in the hall of the Royal College of Physicians, with clinical meetings at the Orthopædic Hospital, Mercer's Hospital, and Cappagh Open-air Hospital, where demonstrations were given respectively by Mr. W. S. Haughton, Sir William Wheeler, and Mr. H. F. MacAuley. On the evening of April 11th the Association dined at the Shelbourne Hotel, and entertained a large number of guests. On Sunday, April 13th, those members who had been able to remain so long in Ireland had a motor drive through much of the most beautiful scenery in County Wicklow, and were entertained to lunch by the Earl of Wicklow at Shelton Abbey, near Arklow.

DR. G. E. SPERO, who was returned to Parliament at the last election as Member for Fulham, is retiring from the House of Commons because ill-health has prevented his regular attendance.

BROMPTON HOSPITAL FOR CONSUMPTION.—The annual report states that more than 2400 new patients were admitted last year, and that there were nearly 40,000 out-patient attendances. Work has been greatly facilitated by the extensive reconstruction schemes which were completed last year. The new X ray department is capable of dealing with 10,000 cases annually. Patients' payments exceeded £6000.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
FRIDAY, April 25th.—5 P.M., MEDICINE. Cinematographic Demonstration: Dr. L. G. Rowntree (Mayo Clinic): Ganglionectomy in Chronic Arthritis. Paper: Prof. Dixon and Dr. G. N. Myers: The Curative Action of Digitalis in Toxæmia. 8 P.M., EPIDEMIOLOGY. Paper: Prof. S. Lyle Cummins: Some of the Clinical and Pathological Factors Underlying Mortality Rates in Tuberculosis.

MEDICO-LEGAL SOCIETY.
THURSDAY, April 24th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.). Dr. A. Knyvett Gordon: The Importance of the Gonococcus in Medico-Legal Investigations. To be followed by a discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W. 2.
THURSDAY, April 24th.—5 P.M., Sir Almroth Wright: Twelve Years' Work on Immunisation of the Blood in vitro.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, April 22nd.—5 P.M., Mr. H. Burt-White: The Importance and Treatment of Hæmorrhage in Pregnancy.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.
WEDNESDAY, April 23rd.—5 P.M. (at St. John's Hospital, 49, Leicester-square, W.C.), Dr. R. Hallam: The Relationship of Erythema Pernio to Acrocyanosis.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, April 23rd.—4.15 P.M. (at the Royal Samaritan Hospital for Women), Dr. John Gardner: Gynæcological Cases.

Appointments.

ABBOTT, EDITH, I. L., M.B., B.S. Lond., has been appointed Asst. Medical Officer of Health, Hornsey.

GRAHAM, J. R., M.B., Ch.B. St. And., D.P.H., Medical Officer of Health, Brighouse.

HIGSON, W. D., M.B., Ch.B. Liverp., D.P.H., Medical Officer of Liverpool Prison.

Hull Royal Infirmary: GILL, J. F., M.B., Ch.B. Vict., F.R.C.S. Eng., Honorary Surgeon. YOUNG, J. N., M.B., Ch.B. Edin., F.R.C.S. Edin., Assistant Honorary Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: BOWEN, G. J., M.B., B.S. Lond., D.P.H. (Haverfordwest); and MACLACHLAN, D. C., M.B., Ch.B. Glasg. (Denny, Stirling).

Medical Referees under the Workmen's Compensation Act: MITCHELL, A. P., M.D., F.R.C.S. Edin. (Midlothian County); MARSHALL, H. F., F.R.C.S. Edin., L.R.C.P. Lond. (Congleton and Sandbach, and Macclesfield); and PINKER, H. G., M.R.C.S., L.R.C.P. Lond. (Totnes and Kingsbridge, and Plymouth).

Vacancies.

For further information refer to the advertisement columns.

Aden Settlement, Arabia.—M.O.H. Rs.800 per mensem.
Bath, Royal United Hospital.—H.S., Asst. H.S. At rate of £150 and £100 respectively. Also H.P. £120.
Bedford County Hospital.—H.S. At rate of £175.
Birmingham General Hospital.—Asst. Clin. Path. £300.
Blackburn Royal Infirmary.—3rd and 4th Res. H.S.'s. £175 and £150 respectively.
Bournemouth County Borough.—Asst. M.O., &c. £650.
Bradford Royal Infirmary.—H.P. and H.S. Each £150.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Bristol City and County.—Asst. M.O.H. £600.
Bristol Eye Hospital.—Jun. H.S.
British Medical Association.—Asst. Med. Secy. £1000.
Burnley, Victoria Hospital.—H.P. At rate of £150.
Cambridge, Addenbrooke's Hospital.—H.P. and H.S. Each at rate of £130.

Carshalton, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £500.
Central London, Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. At rate of £75.
Charing Cross Hospital, W.C.—Physician for Mental Disorders.
Connaught Hospital, Orford-road, E.—Sen. Res. H.S. At rate of £150. Jun. Res. H.S. At rate of £100.
Cornwall County Council.—Locum Tenens, Tuberculosis Officer. £50
Durham County Hospital.—Jun. H.S. At rate of £120.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £150.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Spec. Depts. At rate of £150.
Gloucestershire Royal Infirmary.—2nd H.S. At rate of £100.
Great Yarmouth General Hospital.—Jun. H.S. £125.
Halifax Royal Infirmary.—First H.S. Also Third H.S. At rate of £175 and £100 respectively.
Hastings, Royal East Sussex Hospital.—Jun. Res. M.O. At rate of £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O., also H.P. At rate of £150 and £100 respectively.
Hospital for Sick Children, Gt. Ormond-street, W.C.—Res. M.O. for Country Branch Hospital, Tadworth. At rate of £250.
Hospital of St. John and St. Elizabeth, 60, Grove End-road.—Res. H.P. At rate of £100.
Huddersfield County Borough.—M.O.H., &c. £1100.
Hull Royal Infirmary.—H.S. to Spec. Depts. At rate of £150.
Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.
Inverness, Northern Infirmary.—H.P. £100.
Lancaster Royal Infirmary.—Part-time Radiologist.
Leamington Spa, Warneford General Hospital.—Hon. Ophth. Surgeon.
Leicester Royal Infirmary.—Hon. Surgeon.
Manchester Royal Infirmary.—Asst. M.O. for Massage and Electrical Dept. £100.
Middlesex Hospital and Medical School, W.—Med. Registrarship. At rate of £300.
Montrose Royal Asylum.—Asst. M.O. £325.
Newcastle-on-Tyne.—Hon. Surg. to Gynæcological Dept.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. P. Also Hon. Surg. Reg. £100.
Queen's Hospital for Children, Hackney-road, E.—H.S. At rate of £100. H.P. At rate of £100. Also Cas. H.S. At rate of £100.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.
St. Thomas's Hospital,—Asst. M.O. in Physico-therapeutic Dept. £250. Also Sen. M.O. in Venereal Dept. £675.
Salford Royal Hospital.—H.P., also Cas. H.S. Each at rate of £125.
Sheffield Royal Hospital.—Res. Ophth. H.S., also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—Asst. Cas. O. At rate of £80.
Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £160.
Stafford County Mental Hospital.—2nd Asst. M.O. £600.
University College Hospital Medical School, W.C.—Chair of Bacteriology. £1200.
Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £150.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Surgeon in charge of Orthopædic Dept.
Wolverhampton Royal Hospital.—Hon. Asst. Surgeon.
Worcestershire County Council.—Asst. County M.O. £600.
York, Bootham Park.—Jun. Asst. M.O. £300.

Births, Marriages, and Deaths.

BIRTHS.

CHURCHER.—On April 8th, at Grange-gardens, Eastbourne, the wife of D. G. Churcher, M.D., F.R.C.S., of a daughter.
EDWARDS.—On April 4th, at St. John's Hill, Shrewsbury, the wife of Frank H. Edwards, F.R.C.S.E., of a son.
HUGHES.—On April 10th, at The Mall, East Sheen, S.W., the wife of Royston Hughes, L.D.S.R.C.S. Eng., of a daughter.

MARRIAGES.

DUTHIE—ALLEN.—On April 10th, at St. Peter's Church, Hale, Ogilvie Maxwell Duthie, M.D., to Mary Barbara, youngest daughter of Mr. and Mrs. E. Wagstaffe Allen, of Hale, Chester, and Glossop, Derbyshire.
HARDWICK—JAMES.—On April 2nd, at St. Mewan Church, Cornwall, A. G. P. Hardwick, M.R.C.S., L.R.C.P., *M.C.*, of Island House, Newquay, Cornwall, to Suzanne Clemens James, younger daughter of Mr. and Mrs. R. James, Nakajanka, Newquay, Cornwall.

DEATHS.

CAZALY.—On April 16th, at Earl Soham, Suffolk, Lieut.-Colonel W. H. Cazaly (I.M.S. retired), in his 57th year.
GEORGE.—On April 12th, after a brief illness, W. Stanley George, M.D., of Finchley-road, Hampstead, N.W.
GOVAN.—On April 7th, suddenly, of pneumonia, Robert Govan, M.D., D.P.H.
HUTTON.—On April 7th, Malcolm Hutton, M.A., B.Sc., M.B., Ch.B., D.P.H., late of Shaw, Oldham, and Barrowden, Stamford, aged 49.
SMELT.—On April 7th, at the Royal Sussex County Hospital, Brighton, Charles Allen Casterton Smelt, M.B., C.M. Edin., of Cambridge-road, Hove, aged 66.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

CORPULENCE.*

ITS CAUSES AND CURE.

By WILLIAM F. CHRISTIE, M.D. Edin.

Prof. Stanley Eddington has shown that man is precisely half way in size between the atom and the star; obviously he allows a considerable latitude for personal expansion on either side. If, therefore, some folk are plumper than others I am not prepared to be too dogmatic about them. Yet I believe that each of us has his own ideal figure, the weight at which he feels healthiest, fittest, and happiest. Most men of 25 years of age and women of 20 are physically at their best, and no great increase of weight after these ages seems necessary or advisable. A deviation above 15 per cent. is abnormal, and there adiposity begins.

It is customary to divide cases into two main groups: 1. Those which are caused by exogenous factors: the simple or lesser adiposities. 2. Those which owe their origin to endogenous defects: the complex or greater adiposities. There is probably an intermediate group which includes a number of ill-defined borderland cases whose fatness appears to arise from both exogenous and endogenous causes. In the future, perhaps, this group will be expanded, for we are beginning to suspect that both processes operate in every case to a varying degree.

EXOGENOUS CORPULENCE.

This is by far the larger group. Here fat accumulates on an otherwise healthy person because the intake of energy in the form of food has exceeded the output of heat and work. Physiological equilibrium has been upset.

Nature has arranged that "appetite" shall dictate the amount of fuel which is required for a man's daily activity, but she also provides an internal contrivance for neutralising minor errors of judgment. It is probable that the endocrine glands play an important part in this automatic self-regulating device, but what exactly is its constitution is unknown. It cannot deal with any major errors of judgment, or even minor ones if these are long continued, but its power and strength varies to some extent with race, family, and individual. When physiological equilibrium is disturbed beyond the ability of this mechanism to rectify it, then the excess of food is tucked away within the fat depôts of the body. Thus Nature has granted to human beings a very considerable degree of personal control over their adipose tissues, and that is very necessary.

Racial adiposity.—With those groups of men whose food supply is intermittent, reserves of fat are accumulated on the body during times of plenty to live upon during periods of poverty; some tribes of North America and Central Africa swing annually from the extremes of corpulency to excessive leanness. In the Antarctic a thick layer of adipose tissue is necessary to keep out the cold, and the Eskimo develops it. There are nations that cultivate the fat figure because they like it; for instance, the chances of marriage for the thin Tunisian girl are few. Hindu moneylenders fatten on purpose because a corpulent exterior advertises their riches and their ability to lend. Most European people can become fatter if they want to. Big game hunters tell one that they fatten in the towns before proceeding into the jungle. Uncle Sam, once lean and gaunt, no longer typifies the American citizen who has assumed, as the result of prosperity, more John Bull-like proportions. The reverse process is just as attainable. The corpulent German of pre-war days had disappeared by 1918. I know of no nation that is fat willy-nilly. Perhaps the Jews are cited most frequently as the stoutest race in the world, but then their food is probably the most fat-forming of any.

Familial adiposity.—When we turn from the family of nations to the smaller family of individuals, we note again the inheritance of fat-forming habits. Fat parents develop fat children because they overfeed and under-exercise them as they did themselves. Of course, many families are marked by a common stamp, some being tall, some lean, some better covered, but these are normal conditions, whereas corpulence is abnormal. Dr. Veeder made the interesting observation about a group of fat school-boys that, in every instance, one or both parents were overweight. He studied the home conditions and formed the personal impression that an inherited tendency to corpulency existed. It may be that, if a surfeit of food is indulged by successive generations, the offspring will ultimately inherit

* Being the opening paper at a discussion on Corpulence held by the Harveian Society of London.

weak endocrine glands. Nevertheless, no one has proved it. In my last series of 75 cases of adiposity, 28 per cent. were members of families which ran to fat and frankly blamed their pedigree. They showed no evidence, however, of a sluggish metabolism and the majority reduced themselves to normal proportions by dieting.

Corpulence appears to be an acquired disease, and chiefly the knowledge of how to acquire it is likely to be propagated from parent to child.

Individual Adiposity.

It is instructive to consider first the occurrence of corpulence amongst those who have no voluntary powers of self-indulgence. The infant-in-arms must needs accept the fare which is provided; he cannot counteract excesses of food by voluntary increase of physical activity.

1. *Infantile Adiposity.*

Breast-fed babies.—Occasionally Nature makes a blunder in regard to the quantity as well as the quality of the mother's milk, and unduly fat babies result. Some women have enough milk to feed two childern. It is a common fault for mothers to present both breasts to the infant at each meal, or one breast to him whenever he cries, and the child obtains more milk per day than he actually requires. Sudden over-feeding results in vomiting and diarrhœa; it is the long-continued slight excesses which produce in time the fat child—every day a little more than the infant needs. Too much fat in a mother's milk, although uncommon, accounts for a few plump infants.

Bottle-fed babies.—This type used to be commoner than it is to-day and arose from an excessive allowance of starch and sugar in certain proprietary foods or to adding too much lactose to cow's milk. Children, fattened on the breast or bottle, become slender after their introduction to a mixed diet, but not all escape from the after-consequences. A well-balanced diet of moderate quantity and correct proportions is necessary if the infantile automaton is to preserve the natural proportions. Comparatively slight errors of diet are soon productive of adiposity. The stout hypothyroid child must be distinguished, of course, from the dietetically fat infant. The former belongs to the endogenous group of obesities.

2. *Juvenile Adiposity.*

The growing child, like other animals of tender age, the calf, the lamb, or the puppy, is rarely fat. On the contrary, leanness is typical of the intervening years from infancy to maturity. The maintenance diet of the average school-boy should exceed that of the average adult on account of the claims of growth—3500 calories per day compared with 2500. Growth insists on an abundance of exercise to stimulate the development of bone and muscle, and children who do not jump do not grow.

Nevertheless, corpulence does sometimes occur and is most frequent around the age of puberty. Roughly, 3 per cent. of boys become stouter at that time and a slightly larger percentage of girls. About half of them belong to the endogenous group who show signs of a pituitary or thyropituitary defect, but the others are corpulent without obvious cause. Possibly these have stopped growing temporarily or reduced the rate, as frequently happens. We know that they lose their excess of fat as they grow up, without having altered their daily habits and without any treatment.

Some observers are not satisfied with this explanation. Since the onset of the malady coincides with the development of the sexual functions, they are inclined to blame a temporary disturbance of the glands of internal secretion, although there may be no signs of it. They would place the corpulence of puberty in the "intermediate group" of fat people who owe their over-fatness to the dual cause. Thus, consider the case of girls. The advent of ovarian secretion might be supposed to cause an under-activity of the thyroid and posterior part of the pituitary glands, and possibly an alteration in pancreatic activity. As the glands settle down once more and the board of endocrine control works again in harmony, the obesity disappears. The theory seems probable enough, but we must not forget that the tomboy develops at this time an unusual sedentarism, the same alimentation is continued, while the increased warmth of home life is more sought after than the old rough and tumble of open-air exercise. Girls at puberty are awakening to the maternal instinct which centres around hearth and home.

3. *Adult Adiposity.*

When the adult stage is reached, growth ceases and with it that perpetual motion which characterises the growing child; food should be reduced in consequence, but three additional factors must be considered—namely, occupation, temperament, and possibly climate.

Occupation.—The civilised life to-day is a very unnatural one. The whole method of earning one's living has changed of recent years. This is an age of intensive industry, but it is mechanised up to a point. The fireman of the modern ship feeds his furnace by turning on the tap of an oil spray, whereas his predecessor had to feed his boilers by shovelling in the coal. Labour in many factories is merely the controlling of an automatic instrument. Lifts exist in hotels, houses, and offices to save muscular exertion. Brains have replaced brawn, but intellectual activity does not burn calories. Millions of workers earn their bread by scribbling from an office stool, taking physical exercise more or less desultorily during the week-ends only. Occupation must be granted a large say in the production of corpulence.

Temperament.—The phlegmatic restful person spares muscular movements while those who constantly make small ones expend a great deal of energy in the course of the day. The economy of physical effort practised by the stout is apparent to all.

Climatic conditions.—In the English summer most people lose weight; in the winter they gain it. Perhaps this is due to Nature accommodating the body to external conditions, but more likely the warmth and quiet of indoor life during the colder months helps increase of flesh, while the exuberance of outdoor exercise in the warm ones tends to loss of it. In the tropics most Britishers become thinner.

The quantity of the fuel foodstuffs which an adult requires fluctuates from day to day in accordance with his activity and the coldness of the weather. No person can say that another overeats unless he knows the amount of physical work which that one has to perform. The physician in medical practice needs about 2200 calories of fuel per day while the athlete requires 4000; half of the meat of the one would be surplus to the other's requirements. You will see, therefore, how deep must be the inquiry into the habits of the corpulent before the cause can be determined. Now the exogenous adiposities of to-day are seldom the result of "open" self-indulgence. We eat less, probably, than did our forefathers, although there may still be a few people who think of Heaven as a place with a canteen in it. The gourmand enjoys that sense of repletion which comes from a distended stomach. The majority of our stout patients are gourmets in that they indulge the flavour of certain fat-forming foods. Some are carbohydrate eaters from preference (potatoes, bread, cakes, whisky). Others are attracted to fats only (butter, animal fats, cream, cheeses, oils), while the tooth of a third may be "sweet." This would not matter if they kept the total calorie value of the day's rations reasonably close to their calorie expenditure. But they do not,

When Men and Women get Fat.

Men.—There are two periods in men's lives when they tend to corpulence. 1. After giving up the athletic life to enter business, perhaps to marry and start a home of their own. 2. After attaining worldly prosperity, when they begin to ease off. These are times when activity wanes and appetites should decrease. Remember that Nature is counting calories even though men may have forgotten to do so. This is particularly true in regard to the use of alcohol. Not every man realises that a whisky and soda contains considerable fat-forming potentialities; a small whisky has the energy equivalent of one egg. Few men would care to scoff four eggs after a good dinner, but quite a number will drink four whiskies. Alcoholic drinks, according to the number consumed, ought to be regarded as part of a meal and should not be additional to it. For this reason quite a number of cases of obesity are alcoholic in origin.

Women.—There are three occasions in particular when women become stout: 1. Immediately after growth has stopped. Youthful maidens suffer from adiposity four times more frequently than young men of similar age. Various explanations have been offered. One has regard to the anabolic proclivities of the female and the katabolic tendencies of the male. 2. After child-bearing. About 40 per cent. of obese females date their corpulency to motherhood. Starved of social and athletic pursuits on account of carrying and nursing the baby, young mothers are encouraged to eat to excess of specially selected, highly nutritive foods, to drink Burgundy and other wines to which they were never accustomed, in order—so it is imagined—to maintain their strength and the better to suckle their infants. Most mothers reduce their figures later on by dieting, but some do not try. Successive pregnancies add to the embonpoint. Physicians should guard against over-feeding their patients whether they be convalescent from surgical operation, sickness, or maternity. 3. At the menopause. The physiological decline of the ovaries or their surgical removal would seem to justify the placing of menopausal adiposity in the intermediate group. But all castrates do not fatten. One finds, however, that some of these cases have a basal metabolic rate on the low side, suggesting a thyroid insufficiency, although few fall so low as minus 15 per cent. It seems to me that a woman who

has preserved her figure until the age of 50 has an obvious right to attribute her newly acquired fatness to her loss of ovarian secretion. Nevertheless, many women become less active at this time, sit about more, very often eat more, and sometimes develop capricious appetites. In consequence they suffer from an upset of physiological equilibrium at the very time when their endocrine system of glands is disorganised and incapable of maintaining an even balance.

ENDOGENOUS OBESITY.

A small but intensely interesting group constituting not more than 10 per cent. of all cases. Here we have to look for the cause of the obesity beyond the mere intake of food and the expenditure of physical energy to a defect in metabolism. The disturbance is pathological rather than physiological, and originates as a rule in the glands of internal secretion, one of whose functions it is to regulate the metabolic processes (i.e., defective metabolism through faulty glandular regulation). These victims of obesity have been likened to Strasbourg geese who have fatness thrust upon them. An inexplicable gain in weight is often the first sign of endocrine defect, and may be due to a deficiency of thyroid secretion, of posterior lobe pituitary secretion, of the gonadal, and probably of the pancreatic.

The endogenous obesity of infants is hypothyroidic in origin and develops before the age of two. The endogenous type of juvenile obesity is hypopituitary or hypo-thyro-pituitary in origin and manifests itself somewhere between the fifth and fifteenth year. The corresponding type of adult obesity may be either of these, but is more often pluriglandular. Gonadal obesity is said to occur only after the age of 30, but probably it occurs before this age.

Since the thyroid gland, which is the chief regulator of metabolism is disturbed by any serious or long-continued dysfunction on the part of any one of the other glands, it must be doubtful if different types of endogenous obesity can be truthfully described. Yet some differentiation is interesting from the clinical point of view. It is said that thyroid insufficiency leads to a general deposition of fat—face, neck, breasts, abdomen, with hand and supraclavicular padding. Pituitary obesity is situated about the shoulder and pelvic girdles, with often an apron of fat hanging down from the lower abdomen. Gonadal is a trochanteric adiposity, with mammary and mons enlargement. In pluriglandular obesity the types are fused. I am not a great believer in diagnosing the gland affected from the location of the fat deposited.

Associated with these obesities are the classical syndromes of endocrine defect. A lowering of the basal metabolic rate below 15 per cent. is generally taken as a sign of thyroid insufficiency, and an abnormal sugar curve suggests a posterior lobe pituitary defect, but is not confined to it. We have still to find a reliable test for gonadal weakness.

The cause of these endocrine obesities may or may not be discoverable. Take, for instance, the pituitary gland. There may be a defect in development—a primary hypoplasia. The gland may be injured as by a fracture of the skull, involved in inflammations such as tuberculosis, or poisoned by the toxins of infective disease. It is sometimes the seat of new growths or is pressed upon by tumours originating in the neighbourhood. Other glands have their own particular pathology.

THE CURE.

The modern treatment of adiposity varies with the cause. When this is removed, of course, the fattening process will cease. In the exogenous group faulty habits of living and feeding will need correction. Familial as well as individual traits of temperament and custom may have to be altered, but the ultimate result should be a 100 per cent. cure. In the endogenous group the glandular defect must be repaired. Because this is difficult, results are not so good. Attempts to reawaken dormant glands to renewed activity by the application of electrical stimuli or heat have not been crowned by much success, and substitution therapy is generally resorted to. The hypothyroid case has the best prognosis, since thyroid extract acts as a specific. When more comes to be known of the unexplored realms of endocrinology, better results may be anticipated.

In both types of obesity it will be necessary to rid the body of its surplus fat, and there is no other way to my knowledge than burning it in the flames of metabolic activity. Whatever method of dieting is adopted, it should be accompanied by measures designed to keep the body healthy. Turkish, radiant heat, or other variety of sweating bath promotes excretion of water and the end-products of an unusual combustion. Muscular exercise must be graded in accordance with the patient's strength, and should not be so great as to increase appetite. Massage promotes a sense of physical well-being, but actually its fat-reducing benefits are conferred only on the masseur. The amount of sleep in the 24 hours, the weight of clothes worn, and the prevention of constipation are also worthy of attention.

AN ANÆSTHETIC APPARATUS.

A DEMONSTRATION was lately given before the Royal Scottish Society of Arts by Mr. William Fulde, of the Heriot-Watt College, Edinburgh, of an apparatus which enables anæsthetics of different character to be administered under conditions making for complete safety in control. By means of a compact device it is possible to supply to a patient at will ether (intertracheal or by vapour mask), nitrous oxide and oxygen, or ethylene (or other gaseous anæsthetic) with carbon dioxide. A single control enables the percentage of ether to be regulated within wide limits and permits of any required mixture of chloroform and ether. The volume of supply can be varied from 5 to 40 litres per minute, the quantity passing at any moment being indicated by a simple flow-gauge. A hot-water chamber in the base of the apparatus warms the air current both before and after mixture and can be supplemented by a low-power morganite electric heating element. Air current may be supplied by a motor-blower, foot bellows, or compressed air cylinder. The supply is uniform and there is no risk of liquid anæsthetic being carried across. The whole can be carried in an average-sized attaché case.

A CENTURY-OLD JIBE AT THE STETHOSCOPE.

THE current issue of the *Observer* contains the following excerpt from its own columns a hundred years ago :—

By means of an instrument called the stethoscope, applied to the breast bone, some modern medical writers profess to discover what is going on within. This new art is called auscultation, and the internal sounds pectoriloquism. By means of this new discovery a learned physician professes to have heard a "metallic tinkling" at the heart or in the lungs of a patient. A bystander, however, thinks the "metallic tinkling" was only audible from two pieces of coin which found their way into the palm of the doctor.

The date is April, 1830, 12 years after the appearance of Laennec's classical work and a year after a third edition of its translation had been published in London. Evidently the stethoscope did not come into general use as quickly as some have supposed.

CREMATION SOCIETY OF ENGLAND.

OF late years disposal of the dead by cremation has become much more widely practised; the Cremation Society of England has attempted to bring the importance of this movement before the public, and a steady advance has resulted. Crematoria have been opened at Edinburgh and in Guernsey during the past year; others are in the course of erection at Brighton and Nottingham, and the provision of crematoria is being considered by a large number of municipal bodies. The aims of the society are based on a doubt of the adequacy of present systems of burial. Cemeteries in large towns are overcrowded and expensive, while on the score of hygiene there can be no comparison between cremation and interment. The crematoria established by the society, by beautiful surroundings and architecture, have done much to dispel public prejudice, based, as it is, almost entirely on the dictates of custom. The numbers are increasing of those who choose to have their ashes dispersed in some open, possibly consecrated space, and it would be hard to imagine a more gracious end than that of the golfer whose ashes were recently scattered near a tree on the links which had always obstructed his play. The society makes use of propaganda in the form of simply worded posters for display during Health Week and at similar exhibitions; leaflets are also distributed to members of some of the approved societies and of the national insurance scheme, many of whom are erroneously of the opinion that cremation is beyond their means. The work of the society should meet with success, for the horror of corruption still haunts mankind, even after centuries of burial. With what disgust the Romans must have regarded the Christian custom of interment of their dead; the prevailing dread of cremation is less well founded. "To be gnawed in our graves, to have our skulls made drinking bowls, and our bones turned into pipes, to delight and sport our enemies, are tragical abominations escaped in burning burials. Urnal interments and burnt relicks lie not in fear of worms, or to be an heritage for serpents."

FIRST-AID BY RAILWAYMEN.—The Canadian National Railways, with the coöperation of the St. John Ambulance Association, provides a corps of experts to teach first-aid to their 100,000 employees. The work has just been extended by placing in service a car fitted as a miniature railway hospital, which is shortly to be followed by two others. It contains full emergency equipment and a lecture theatre for demonstrations, and will be used principally in the more remote parts of the Dominion where there is a scarcity of instructors with few opportunities for studying first-aid.